

ALEXANDRIA

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LETTERS TO THE EDITOR

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To : Members, SF
From : Vinutha J.¹

Remember the day we met
For more Knowledge to get.
Both my eyes are wet
When parting time is set.

Science Forum to me, was an eyeopener. It helped me immensely in discovering and appreciating the secrets of nature, very cleverly masked all around us. I am very grateful to the organisers who are now actively running the Forum; their simplicity and modest behavior will always remain green in my memory.

Hope the Science Forum would help many more students like me. I wish it a glorious success.

Sept 15, 1983.

¹Vinutha J., a dynamic member and Treasurer of SF, dropped out and joined Dr. Ambedkar's Medical College, last year—Ed

On 'pizza' and 'Nalanda'

Sir,

The other day, Mr. Ganeshan (the Meteorologist), raised a minor debate on the appropriateness of 'Alexandria' as the name of this mag. I was struck by the crispness of the debate, which I relate here.

"But, why the name 'Alexandria'?"
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I do understand all your views of internationalization

of science, but I distinctly feel that just as people here tend to associate themselves far better to say, masala dosa (= Nalanda) than let's say, pizza or, hamburger (= Alexandria). I feel that people would feel more at home with the name 'Nalanda' than with 'Alexandria'."

But what if people can't choose between 'Nalanda' (= masala dosa) and 'Alexandria' (= pizza), which is largely true?

Uma Shaanker R.

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I must complain on the unjustified delay you have caused in bringing out this issue of Alexandria (due on Oct 1983). A number of other fellow members also share my sentiments (the rest believe that Alexandria is a mirage).

In the first issue (May 1983), you promised it as a weekly, then made it a bimonthly, later, a monthly issue (Sept, 1983). Now, I fear, it has leapt into a few light years period!

By Alexandria, Wake up Ed, let our Phoenix not take too long a slumber, lest it may forget to rise again from the stencils!

By the way, there is a rumour that you are quitting. If true, then I can't resist from writing the following

"There once was a campus Editor,
Who managed a mag to the last

letter,
And when he dropped out,
The sentence in everybody's mouth
Was, "Ah, for the better"

Uma Shaanker R.

Your letter writing has gone from bad to worse—Ed.

T.D. 17.10.83

gk

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15.10.83

guruji

BUTTERFLY COLLECTION: AN OFFENCE?

3

Many of us are aware that collection of butterflies as well as their export is not practiced by some countries. But did you know that India also has a law against the collection and export of butterflies?¹ This revelation was quite a shock to a student (like me) who has collected and killed many butterflies during the course of his study. It is interesting to note that in our University, this full swing collection of nature's finest beauty is being done under the direction of the Department of Entomology !!

It has not been clear to me whether the Department is aware of the law or do they feel that the collection will be a control measure to overcome caterpillar problem in the fields? They may even defend that the collection is in a small scale and for study purpose only.

In any case, I have roughly estimated figures, just to show the magnitude of the UG collection alone. In a year, at least 500 students will be engaged in butterfly collection (approximately 200 students from II yr. B.Sc. (Agri), 250 from III yr. B.Sc. (Agri.), 25 from B.Sc. (Ag. Mark.) and 35 students from B.Sc. (Hort.)). On an average, a student submits 6 butterflies. To retain 6 butterflies at the end of the trimester, he would have killed around 15 to 18 (as majority of these will be damaged while collecting and some will be lost as food for ants and cockroaches while drying). Thus the actual number of butterflies killed by UG students in a year amounts to 7500+. There are nineteen Agricultural Universities in India, most of them with two campuses (some more than two) offering UG courses in Entomology. A simple calculation shows that over 20,000 students collect and kill at least 2,00,000 butterflies every year !!!

Would our Entomologists explain or defend this carnage?

I feel that only a few permanent specimen can serve the purpose of identification and study of the beautiful butterflies.

Vishwa Ranjan Amatya

¹ Naresh Chaturvedi, Asst. Curator, BNHS, "तितलियों के संग्रह और नियंत्रण प्रक्रिया है" Kadambini Sept. 1983.

SNOOPY IN CAMPUS



ENTOMOLOGY COURSES & BUTTERFLY COLLECTION

4

ONE DAY IN THE CAMPUS...



One of the things that the UG students at the UAS dread most is the insect collection assignment that is given in many of the courses offered by the Department of Entomology. Unfortunately, this appears to have resulted in some students even hating the subject itself. And, there are also quite a few students like Mr. Ranjan and me who think that this assignment might have resulted in mere slaughter of thousands and thousands of beautiful insects every year.

First, let us see why at all the Department insists students in most of its courses to collect and submit insects. The main objectives of this assignment are :



1. To expose students to the natural habitats of insects :

-- Students who have a slight inclination towards nature might really turn into very good naturalists - they might become very good ecologists, ornithologists or poets.

-- When insects are seen alive, in nature, they look certainly beautiful and some students might fall in love with insects and become very good entomologists.

-- This is a field exercise that most of the students enjoy - because it involves thrill and triumph, unlike field work in other courses.

2. To make students aware of the enormous damage that at least some insects cause to some crops.

-- By collecting insects in the field itself, the students learn more and certainly better than by just seeing some dead and preserved specimens (and making diagrams) in the class room.

-- By asking the students to go out to the field and learn about insects, the Department has just expanded the 'class' beyond its four walls. For this, the Department certainly deserves appreciation.

The question, whether these objectives are being achieved or is it just resulting in indiscriminate slaughter of insects, still remains unanswered. If this is resulting in the latter, then it is

Dissecting the Mind

Rigid thoughts
are like molecules of solids-
resisting any change of motion.

Perceptive minds
are like molecules of liquids-
flowing fluently.

Erratic ideas
are like molecules of gases;
as they collide their magnitude
determines their destructiveness

John Gow

Unseen and Seen

You do not believe in what you
cannot see?
Oxygen? Electricity?

Magnetism? Weight?

Photosynthesis?

Someone who can create

Such common place miracles? If
all this

Leaves you in disbelief,
Look at a leaf Dorothy Long
certainly not a matter to be taken lightly.

The Skunk

None have of sorrows deeply drunk
So much as has the lewly skunk;
Of all the creatures writ about
He is the most maligned, no doubt.
For this I see no cause at all,
He is a charming animal,
He really has a pretty tail,
Much niser than the yak or quail;
And quite unlike the vulgar leopard,
Who every where with spots is peppered,
And quite unlike the tiger who
Of markings has a score or two,
The genteel, unassuming skunk
Is glad with one upon his trunk.
He walks with slow majestic tread,
Which shows at once he is well-bred.
His courage you've no cause to doubt,
He's often put a mob to rout.
The genius of his soul is shown
In that he always lives alone.
His manners are not low or loud-
You'll never find him in a crowd.

I. N. Dubin, M.D

Vicissitudes of the Creator

According to some writing exposes ego

helpless-

ly like

a tortoise

on its back

or psycho-

analysis

Louis Mann

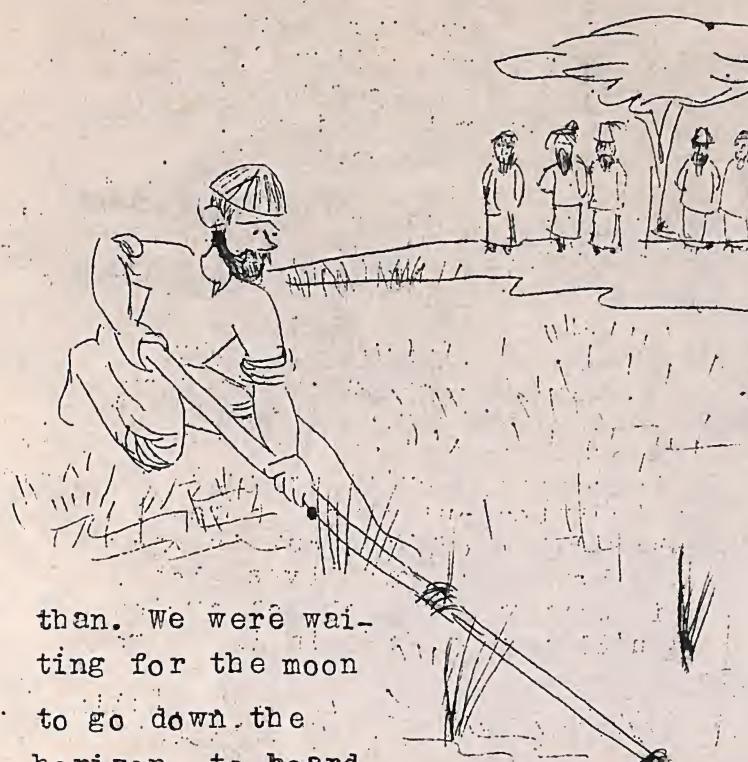
We know that insects are the most successful organisms on this planet, and one of the main attributes for this, is their high reproductive capacity. It is 'said' that just one pair of house flies when allowed to breed with 'unlimited' resources would produce 1,000,000, 000,000,000,000 house flies in just 6 months. This is, however a gross exaggeration of the reproductive capacity of insects. Moreover, how can any insect be so fortunate to have 'unlimited' resources in nature and no natural enemies or any other form of resistance from its environment? So, inspite of insects having a high reproductive capacity, it is still not justified that we should kill them indiscriminately, if we are not using the collections for any scientific or learning purpose.

Readers of Alexandria will certainly be interested to read about a 'Committee For the Conservation of British Insects' in U.K which has set a 'Code of Insect Collection' (Entomologists Gazette 23 : 135-137).

Is it not time for us to have thought about a similar Code for the conservation of the Indian insects?

V. V. Belavadi

THE MIRSHIKARS AND THE BLACK-NECKED STORKS



It was on one of those frightfully cold North Indian winter nights when I first heard this unusual story on the association of the Blacknecked Stork (Xenorhynchus asiaticus) with the marriage formalities of the Mirshikars, as we (a colleague, the Mirshikars and myself) sat talking, huddled around the camp-fire in the Bharatpur Bird Sanctuary in Rajas-

than. We were waiting for the moon to go down the horizon, to board our boats and vanish into the pitch darkness to erect a 200 m long net for duck trapping, which was a part of Dr. Salim Ali's bird ringing project, that I was working in.



Mirshikars, a group of Muslims living in various parts of Bihar, are professional trappers since several generations. The abundance of bird life and lack of proper enforcement of Wildlife Rules in Bihar has enabled the Mirshikars and certain others to make bird trapping an occupation of their caste.

From generations, the rule had been laid out that if any Mirshikar youth wished to marry a girl of his clan, besides fulfilling all other conditions and formalities, he would have to catch an adult black-necked stork alive, single handed and unarmed but for a glue and rod device. Here, let me digress a little to describe how the device works. It is made of several canes, each an inch in diameter and about 10 ft in length, tied one on top of the other, thus making a single rod of considerable length, gradually tapering towards one end. At the tip of this rod a slightly upturned, trifurcated stick is fixed, and on it a kind of very strong glue is applied.

The Mirshikar youth holds the other end and slowly manoeuvres it with amazing skill towards the bird standing quite far away. The bird

¹ In Bihar, the stork is locally known as "Loba Sarang"

would not fly away because the 'man' is at a distance, but hardly does it know that the stick, approaching steadily, is 'remote controlled'. When the tip of the rod reaches a proper distance, the youth would give a quick forward jerk to the rod and the glue-stick fastens itself on to the wing of the bird. The trapped bird cannot free itself from the glue rod device and it is at this point that the real purpose of the test--a test of courage of the bride groom comes into play. Mirsbikars consider "Loba Sarang" to be a king of marshy habitats because of its proud stance--the way it stands like a true monarch, its head held high, as if challenging anyone who dares to encroach its domain. Besides, the bird stands a full four and a half feet and is extremely ferocious when cornered and would stand on flexed knees ready to leap forward and plunge its foot long, massive, dagger shaped beak into the body of the opponent.

Hence, even if trapped, it is extremely difficult to catch this tall, huge bird with an agile neck. One needs to be careful and very courageous to avoid the stabbing ^{beak} and catch it bare-handed. So, it is no wonder that the Mirsbikar father believed that he who can catch this 'King', would be a worthy match for his daughter...

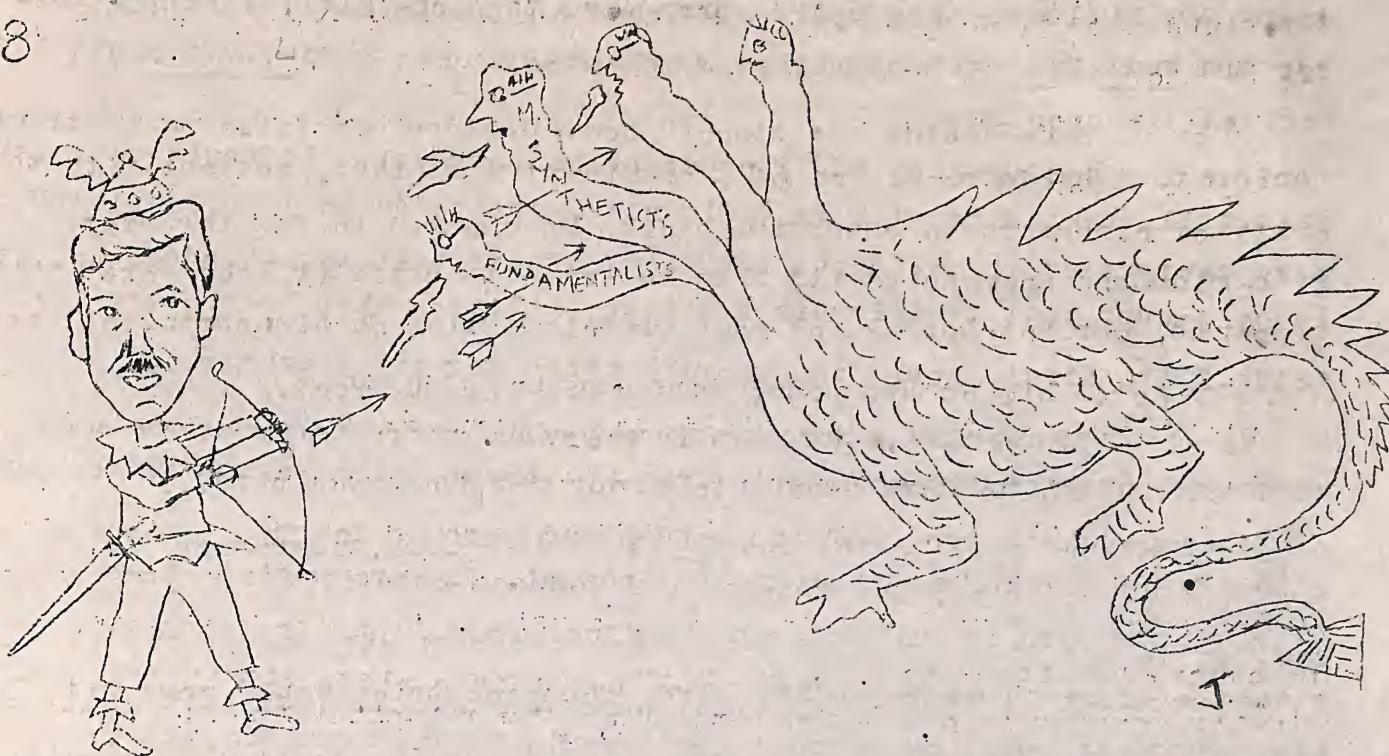
Now let's go back to the story. On the appointed day of marriage, the bridegroom starts from his house with a party comprising of his people and those of the bride, and marches towards the place where "Loba Sarang" is known to be present. The procession stops as soon as the bird is sighted and the groom goes alone to catch the bird. If he succeeds in catching the bird, the procession would move with him to the bride's house and 'nikha' would take place. In case he fails to catch the bird that day, the marriage would be postponed. When he finally manages to catch the bird after several attempts, the marriage date would be fixed and the wedding is solemnized. As it was prevalent among the Muslims, they could marry more than one girl, if they desired to, but each time the catching of the stork has to be repeated !!!

This custom was stopped some decades ago following a tragic accident. A bridegroom, son of a prominent Mirsbikar, set out with the party of observers to catch the stork. He managed to fix the stork with glue and approached it. When he tried to catch it, the worst thing happened, perhaps because of some miscalculation on his part--the bird fatally gored him on his side, and he died on the spot.

Since then, the Mirsbikar youths marry their girls with a sigh of relief, no more having to chase the dangerous bird...

STEPHEN JAY GOULD-The Prince of Modern Biology

8



When a student asked the famed anthropologist Ashley Montagu as to what Stephen Jay Gould's field of specialisation was, he found only one answer possible - "Versatility". To get even an inkling of the burdensome range that this word carries when applied to Gould, I will have to quote Montagu further : "Gould is a Professor at Harvard and lectures on geology and paleontology; he also teaches courses in biology and the history of science, and writes on physical and biological anthropology, growth and development, evolutionary theory, human nature, intelligence testing and sociobiology, to name but a few areas of his competence." Though a paleontologist by training, it is evident from this that Gould is a biological scientist with far ranging interests.

Having specialised in a science that is associated in the common mind with pallid scientists poring over dusty specimens in dingy rooms cataloguing one dreary detail after another, Gould has risen to be the reigning 'Prince of Biology'. With uncanny precision he prods and jabs with his pick and hammer at every chink in the armour of his opponents. Not many have had the stamina to parry these powerful thrusts and withstand his withering onslaught. With pen and tongue he has been fighting a battle royal on many fronts in the biological arena for over a decade.

Utter a biological profanity and you can be sure to raise the backbs on Gould's back and a more formidable opponent you will not face. With unmatched wit and erudition he will demolish your most cherished notions.

In the winter of 1981 at Arkansas (USA) Gould was one of the star witnesses (along with Michael Ruse a philosopher of science, Brent Dalrymple a geologist, Francisco Ayala a geneticist and Harold

Morowitz a biochemist) who was called upon to testify against the demand of the creationists that Genesis be taught along with the theory of evolution in school biology classes. By sheer intellectual power these men battered the defense and the leaders of the 'Creation Science Movement' were left licking their wounds as the judge unhesitatingly struck down their unreasonable demand. Paradoxically, the Creationists quote Gould himself in their popular publications to buttress their argument that biologists themselves are still undecided over the validity of the theory of evolution. Consequently, the theory of evolution is not a proven fact say these ^{religious} fundamentalists. They seem to have missed the point that though there is currently much debate on the mechanisms of evolution, no biologist denies that evolution has actually occurred. Contrary to popular mythology even Charles Darwin wrote of more than one mechanism of evolution. In this connection Gould in his incisive style said "Evolution is a fact, like apples falling out of trees. Darwin proposed a theory, natural selection, to explain that fact. Newton's theory of gravitation was eventually superseded by General Relativity. But apples didn't stop in the mid-air while physicists debated the question."

While the evolution-creation controversy seems to have at least temporarily abated, Gould has been in the center of another storm since 1972 when he co-authored a paper with Niles Eldredge, ^{Curator} of the Department of Invertebrates at the American Museum of Natural History. In this paper, titled "Punctuated equilibria : an alternative to phyletic gradualism" Eldredge and Gould depart from Darwinian orthodoxy and state that the fossil record, though incomplete, ought to be taken seriously. They emphatically state that the principle feature of most fossil species is stasis and not change. The origin of new species and the extinction of old ones punctuate the fossil record. And so, going by the ~~fossil~~ evidence, species arise abruptly (on the geological time scale) and not gradually as postulated by the Modern Synthetists like Mayr, Dobzhansky and Simpson. While battling over the validity and extent of occurrence of this mode of evolution Gould has raked up yet another controversy to which he has given the colorful (though disparaging) title of "The Pan-Glossian paradigm".

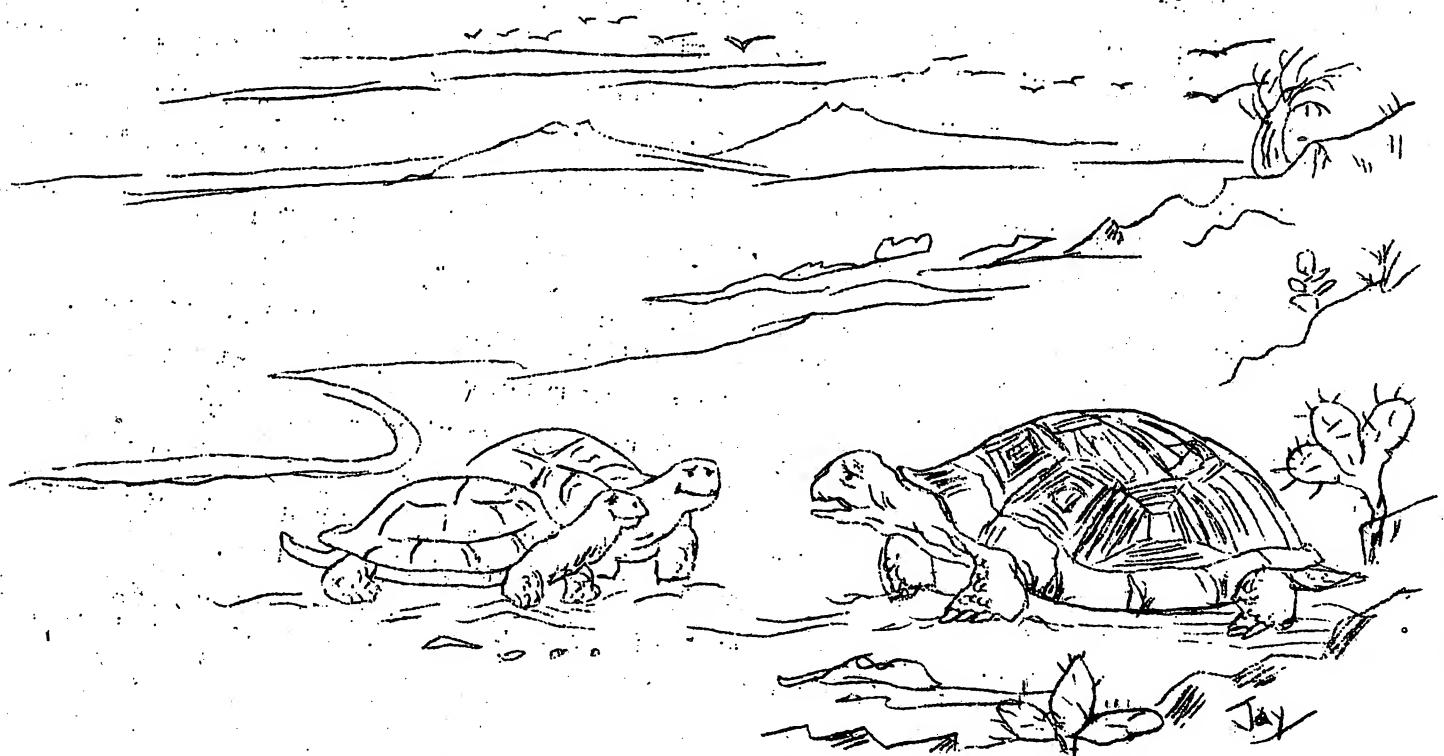
The Modern Synthetists are again the focus of his attack. According to them every species has a morphology that adapts it to its environment. Thus, a radically different environment would entail organisms of different sizes and shapes; for only they would be adapted for survival in such environments. This implies that all sizes and shapes are possible if the ecological opportunities exist.

Gould and others on the other hand, maintain that though adaptation is important it is only a subsidiary factor in determining the

morphology of a species. To them morphological design is an adjunct to the mechanical properties of the building materials and the rules that govern embryological development. Thus whatever the ecological conditions, all shapes and sizes are not possible.

But then, many feel that these views have been aired and that nothing new is being said. Gould made a fitting reply to this accusation at the end of the now (in)famous conference on "Macroevolution" at Chicago in 1980, when he said that "it is not so much what is said that counts, but what is done. These phenomena we talk about may have been acknowledged by the Modern Synthesis, but the principle guiding all the work of the past few decades has been ^{tat}adaptationism."

All this would perhaps have created the impression that Gould is accessible only to his professional colleagues. But nothing could be farther from the truth. He is one of the finest writers in the biological sciences who is accessible through his popular essays in 'Natural History' the monthly magazine published by the AMNH. Those, in India, to whom this magazine may be inaccessible need not despair for many of these essays have been reprinted in the British popular science journal 'New Scientist'. In addition three collections of these essays in which Gould reflects on natural history have appeared under the titles 'Ever Since Darwin' (1977), 'The Panda's Thumb' (1980) and 'Hen's teeth and Horses toes' (1983). Intriguing titles that should beckon the curious to take a dip into some of the most exquisite essays in contemporary natural history to be convinced like J.B.S. Haldane that science is "vastly more stimulating to the imagination than are the classics." Haldane, however, had a complaint. He felt that, "the products of this stimulus do not normally see the light because



"I knew Darwin. Nice guy."

scientific men as a class are devoid of any perception of literary form". But then, he did not have a Gould to satisfy his "connoisseurial" tastes.

It is not only in writing that Gould excels. He speaks with equal charm and felicity, so much so that he can cast a spell on even those hard-boiled physical scientists: astronomers and their ilk who normally don't care a whit for the soft and mushy (in their opinion, that is) biological sciences. At one AAAS seminar these "bubrists" packed the hall to listen to Gould speak on the "Hardening of the Evolutionary Synthesis". When Gould concluded his speech and Ernst Mayr the celebrated Harvard biologist and one of the architects of the Modern Synthesis got up to speak, they all walked out in unison.

Gould's phenomenal appetite for work is sometimes the despair of his colleagues. "He calls me at 11 at night Massachusetts time and we talk until 11, my time," says David S. Wardruff, a biologist at the Univ. of California, San Diego. "Steve starts getting creative at midnight, works until 2 or 3, then gets up at 6:30." In spite of this busy schedule, being an accomplished singer, he finds the time to sing baritone for an amateur chorus, the Boston Cecilia Society.

Gould has been in the forefront of the attack on another synthesis - though a new one this time - Sociobiology. This discipline was solemnised by the publication of the Harvard biologist E.O. Wilson's monumental book - Sociobiology : the new synthesis in 1975. While this work has been praised for its breadth of scholarship, it has also been selectively reviled for some of its conclusions. In this debate Gould says that he finds himself "among the smaller group of detractors." But then, it is qualified criticism that he has for the remarkable and stupendous scholarship that Wilson puts on display in this magnum opus. "Most of Sociobiology wins from me the same high praise almost universally accorded to it," says Gould. "But Wilson's last chapter, "From Sociobiology to Sociology" leaves me very unhappy indeed. After twenty six chapters of careful documentation for the nonhuman animals, Wilson concludes with an extended speculation on the genetic basis of supposedly universal patterns in human behavior."

Many reviewers and reputable scientists (Wilson included) argue that Gould and the rest of the small band of detractors have let their political ideals (of human perfectibility) cloud their scientific vision of the constraints imposed "on human nature" by biological factors. In countering this argument, Gould states very clearly that he does not deny that man is an animal subject to biological laws, but, says he, the issue "is not universal biology vs. human uniqueness, but biological potentiality vs. biological determinism."

Gould et al. are further accused of attributing motives to

innocent scientists who are merely in search of unsullied truths irrespective of political implications of their findings. To this he says, "I make no attribution of motive in Wilson's or anyone else's case. Neither do I reject determinism because I dislike its political usage. Scientific truth, as we understand it, must be our primary criterion. We live with several unpleasant biological truths, death being the most undeniable and ineluctable. If genetic determinism is true, we will learn to live with it as well. But I reiterate my statement, that no evidence exists to support it, that the crude versions of past centuries have been conclusively disproved and that its continued popularity is a function of social prejudice among those who benefit most from the status quo."

And then, he concludes one of his most brilliant essays in the polemical mode with the following words: "we are both similar and different from other animals. In different cultural contexts, emphasis upon one side or the other of this fundamental truth plays a useful social role. In Darwin's day, an assertion of our similarity broke through centuries of harmful superstition. Now we may need to emphasise our difference as flexible animals with a vast range of potential behavior. Our biological nature does not stand in the way of social reform. We are, as Simone de Beauvoir said, ... the being whose essence lies in having no essence."

These extensive quotations make Gould's complex stand on some of the most touchy issues in contemporary biology apply clear. In this light Lewontin's poignant words about the "text book myth" of the objectivity of scientists having no congruence with reality, ring true. He tells us that "the more important the issue and the more ambiguous the evidence, the more important archetypal prejudices, and the greater likelihood that two diametrically opposed and irreconcilable schools will appear... Schools of thought about unresolved problems do not derive from idiosyncratic intuitions but from deep ideological biases reflecting social and intellectual worldviews." No one is left off the hook here, Gould and Lewontin are as much subject to their ideological biases as are all other thinkers, be they biologists, sociologists or physical scientists.

The range of topics on which Gould has written with both brilliance and wit calls to mind T.H. Huxley - another polymath of recent times - in whose mould he seems to have been cast. While Huxley, about a century back waxed eloquent on "A piece of chalk", here is Gould writing entertainingly and earnestly on one who is dear to the hearts of all Americans, Mickey Mouse, the impish creation of the legendary Walt Disney. Wait a minute - did I say impish? Well, then I'm wrong, so Gould tells us. After making a study of the degree of pointedness

of Mickey's nose and the roundedness of his features over the period from 1928 (when Mickey made his debut in 'Steamboat Willie') to his last cartoon in 1953, Gould traces the veritable "ontogeny" of Mickey from an imp who doesn't hesitate to tweak a pig's nipples to a cuddly little mouse who can't even subdue a squirting clam. In the course of 2 or 24 pages, while he is "fiddling around and having fun with a 'mouse like that', Gould not only tells us in passing that he still prefers Pinocchio to Citizen Kane, but he expounds on another of his favorite themes that humans are neotenic. Neoteny which literally means "holding youth" is invoked by Gould in this context to state that we have "evolved by retaining the youthful features of our ancestors."

In another of his thought provoking essays he asks his fellow Americans the question "Do we really need the census?" A question that could have been addressed to us Indians, who take pride in the ten yearly ritual of going through the motions of counting each and every individual in the world's second most populous country. A stupendous feat indeed- this counting of heads! But at what price? How accurate is it? And, why go through this elaborate ritual? Gould emphatically states : "The census has always been controversial because it was established as a political device /remember the recent poverty line controversy?/, not as an expensive frill to satisfy curiosity and feed academic mills." He has no quarrel "if it were possible (however expensive) to count the whole with confidence...But some it is not...for people are much harder to find than others... by the complex of unfortunate circumstances that renders the poor more anonymous than others..."

He says that the common sense idea (recall Einstein's words that : 'Common sense is the set of prejudices that one acquires before one is 13 years old') of counting all "is probably the worst and certainly the most expensive way to conduct a census." Instead, "schemes of careful sampling and inference... would do a better job."

Today at 43, Gould is an ailing man. He suffers from a deadly disease - mesothalessemia - a form of cancer that afflicts the membranes that line the organs of the body. But as this dreadful disease relentlessly stalks him, Gould remains as busy as ever - writing, lecturing, investigating, and ofcourse living (with his two sons Jesse and Ethan and his wife Doborah).

--- Prashanth

THE LIVER

The ways of the Liver are odd,
They're understood only by God.

Any man who proclaims
He has fathomed its aims
Is either a fool or a fraud

I.N.Dubin, M.D

AQUARIUM VISIT

One fine evening during Nov '80, we (six members of SF) had an opportunity to visit the fascinating Aquarium near Cubbon Park. The Aquarium is a diamond shaped octagonal building, unique in its architectural beauty. It consists of three floors. The first and second floors house the largest number of varieties (in India) of fresh water fishes. Indigenous and exotic, cultivable as well as ornamental pet fishes are displayed.

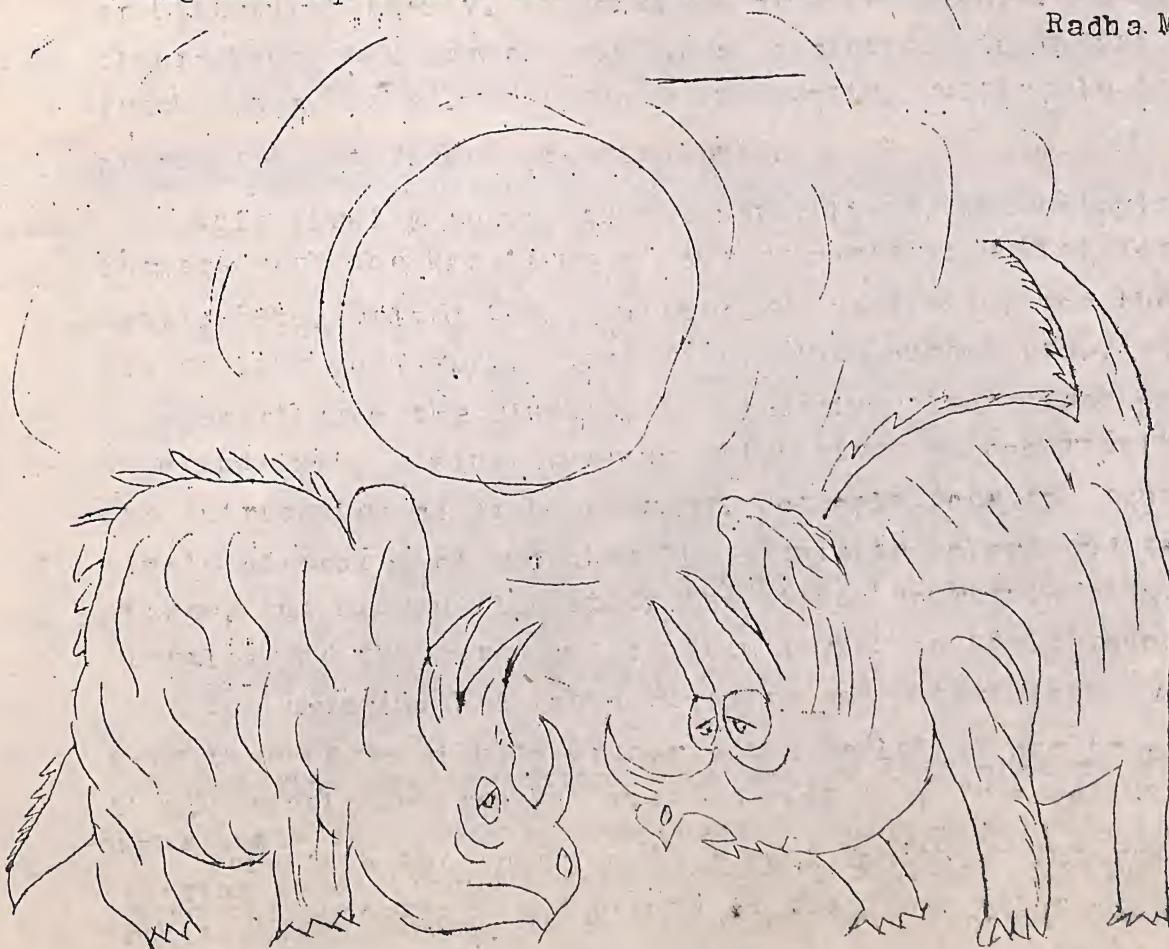
This display acquaints the naturalists, the hobbyists and the fish farmers with the knowledge of our resource potential for fish culture. Catla, Rohu, Silver Carp (cultivable varieties) and the ornamental fishes like Gold fish, Angel fish, Blue Gourami etc., were eye catching.

Apart from the display, the aquarium also guides people interested in maintaining a mini-aquarium which gives an opportunity to observe the intricacies of fish behavior. Not only does an aquarist enjoy the simple pleasures of watching the exquisite colors and forms of the fishes, but he can also study the fishes' courtship rituals, territorial battles and the care some of them lavish on their young.

The aquarium has both educative and entertaining value. We realised that if we wish to preserve the wealth of our tropical fishes, then, aquatic environment must be kept free from pollution.

A visit to the aquarium is a must for those interested in appreciating the importance and beauty of the fresh water fishes.

Radha Mani T.R



"I FORESEE AN UPTURN WITHIN THE NEXT SIX TO EIGHT MILLION YEARS."

I am writing of those days when I had just completed my Mater's degree and was looking for a place and person to start working for my Ph.D. My ramblings in the library over the work of many a biologist, instilled in me a desire to look for one, under whom I could work.

Alas, gone were the days when one could visit a renowned Professor and request to be accepted as his student. These Professors are now almost extinct.

A very interesting feature of such apprenticeships was that you came to be regarded as one of the 'family'; so much so that apart from being involved in assisting the Professor, you also catered to his personal work- may be like preparing his lectures or perhaps picking up his wife from the airport. For few, who might be rightly considered fortunate, there is the chance, if enough promise of work is shown, to be offered his Prof's daughter's hand !

In the heydey of physics, in the early 1930's when physicists were likened to God, students from all over the world flocked to the University of Gottingen to learn under the 'Grand-masters'. In the course of their scholarly exchanges there occurred many a matrimonial ties with their Prof's daughters. These students were so highly regarded then, that even the inn-keepers in Gottingen used to vie with each other to to lodge them, hoping that they (students) would become their son-in-laws later. But before you start wondering what am I upto, let me confess that these were somethings I learnt from books and recollections by eminent scientists and I wished that if not with the daughter, let me be atleast fortunate to to be involved in scholarly exchanges with the Professor. And thus began (or rather ended) my hunt for a Professor!

It was a blistering summer afternoon in 1930. The mercury showed 47°C. I was in Madras to meet Dr. Janaki Ammal, a renowned cytogeneticist. She headed a small but determined staff at an experimental station in Maduravoyal, about 15 km from Madras Central. The experimental station itself was reminiscent of some of those interesting labs I had read of. Without the bustle-bustle of a confused city, calm with the palm leaves swaying in the hot waves and only cyclists and buffaloes to confront with, I found the place quite and serene.

The station housed both the laboratory in which four of her doctoral students worked and a residence for Dr.Janaki. She had no family of her own (!). The lab was one which you could call an 'ideal'; on one side against the wall was glass paned book shelves overflowing with chromosome atlases, encyclopaedias volumes of botanical studies and a number of other classic books. Much of the books and literature material were her own, written and collected over

a period of years when she worked abroad as a cytogeneticist. A major part of the room was occupied by work tables with the ubiquitous microscopes on it. Against one corner were arranged few chairs, where you could relax after every stint of hard work.

I was received at her lab by one of her graduate students. Dr. Janaki herself, I learnt, was not feeling well. I learnt from the student that the main work in the lab then was on several studies on the cytology of some medicinal plants native to South India. This involved extensive surveys on their availability and breeding systems. Dr. Janaki occupied much of her time (she was then 78) in writing a book on the 'Medicinal Plants of South India'. My aspirations to work with her was deflated when the student told me that she wasn't taking any more students. She had decided to retire. She was then 79/80.

Nevertheless, I asked the student to take me around the experimental garden. In it I found growing a number of experimental oddities where marriages between very strange bedfellows was accomplished. One of them for which she became famous was a cross between sugarcane and maize. A live specimen of this cross was maintained there. However, standing there, in that hot and quite afternoon, the plant failed to arouse any awe in me (it neither had the freshness of the cane, nor the succulence of maize). After a few more strolls across the dry garden, we went into the lab once again.

Meanwhile, Dr. Janaki was informed of my visit and my wish to see her. When we went inside, she was seated at the cosy corner. I never knew that she was so old. She was decrepit and bespectacled. Her face was full of lines. But amongst all this stood out her clear sharp eyes. She offered me a chair and once again told what I already learnt from the student - that she had stopped training students under her. Surprisingly, I didn't feel disappointed at all*. I made some small

*In retrospect, I feel that, that was no let down to my initial enthusiasm. I found her (probably because of her age), very mild, soft spoken. I personally however, would like one who is as much 'vociferous' as he/she is 'workiferous', maybe bordering on a little arrogance also. Then, you have an opportunity to engage in wordy battles (provided ofcourse you have the good fortune of being retained at all).

In this regard, I recall having read a few years back the reflections of few students on their mentor, Sir Hans Krebs, the person who discovered nearly half of the biochemistry that we know today. He was a 'strict' master. He had a number of labs under his supervision. A student was admitted based on his 'entrance seminar'. However, that was not the end. As a resident doctor making the rounds, Sir Krebs would visit each of his labs everyday, starting at 9.00 am. The results of the experiments of the previous day were to be plotted on the black board and kept ready for his scrutiny. An assignment given was to be completed on the same day. He would tell them, "I want you to report in the lab every morning at 9.00 am. You are free to go home at 5.00 pm. But, I want the experiments to be completed today", (which meant that the students had to necessarily stay in

Cause and Effect

Preoccupation
with cause and effect
helps to expand
the intellect,
but limits it
as well to facts
which will be writ
in proper tracts.
Yet, what to say
of Brownian motion
constantly
in every ocean?

And better still,
what is the Cause
of all there is
or ever was?

Samuel Stearns M.D.

Small talk on how much I liked the place and how kind of her to have agreed to meet me etc., I invited her to my University when she next visited Bangalore. "No, no I don't think I will visit any place again. Thank you," she said. I left.

I walked the sands of the Bay of Bengal shore, thinking of the cosy but yet lonely laboratory of Dr. Janaki, the age worn Elevator and the dusty old books in the Madras Univ. Library with only the smell of history left behind in those dark recesses... only the crumbling books, bearing obscure names, pencil etchings and the dust and grime laden creaking tables and chairs, stand as mute witnesses to the number of long forgotten scientists who had once trudged the floors of the library...

'OBELIX'

Dr. Janakiammal Died On 8 Feb 1984...

their labs over night and then again report in the lab at 9.00 am the next day).

There is another instance I recall about research students spending their time in the library. When Sir Kreb saw that few of his students took refuge in other scientists work (among the journals) than in their own lab, he is known to have told them, "I don't want to see any of you in the library. But, I also want you all to keep abreast with the latest work"!

Though they might have had a tiring time with him, in their recollections, the students speak of such a practice very highly, as it makes one spend his time usefully. Also, when it is practised by the Guide himself. Even after his retirement, he headed a lab and at 80, he was still the fire-brand that he was known earlier to be!

I would have liked to work under such a person.

For the Martyr

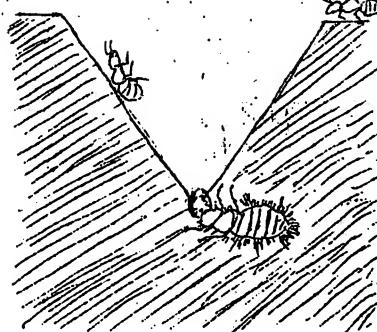
Drosophila melanogaster
is the most
sought after.

It is not the name
of some terrific
looking dame.
It's just an
ordinary fruitfly
that has raised our
genetics knowledge
so high.
So it's fit,
to pay homage to it.

For, the millions of flies
that have died,
Have answered,
As to how we're alive

'Jughead'

THE ANT-LIONS



At first glance the adults of antlions resemble dragon flies, but differ most conspicuously in having antennae with club like tips. The wings are narrow and long, having rich network of veins and mostly transparent with black or brown patches. They have a long slender and delicate body. They are predators and have biting mouth parts, but take little nourishment and live for just a few weeks.

Being insects of the summer, they are often found hovering around lit bulbs or tubes at night, and flutter about in the sunshine during the day.

The eggs are laid in loose groups on sandy soils. Earth-colored, lively, snappish larvae hatch out of those eggs. Famous among the larvae of anlions are the species that build pitfalls in the shape of perfect funnels or inverted cones. Numerous such funnels are often found side by side in any sandy spot.

It is hard to comprehend how such a primitive creature, perhaps no more than a quarter of an inch long, constructs a funnel as deep as 2" and 3" in diameter. Then, it lies buried at the bottom, waiting for an ant or other insects to fall into the funnel. Does the master craftsman know that he is setting a trap and that too, the best possible of its kind-- does he know that some prey will fall into it? Perhaps, it acts according to an inborn urge.

For constructing the funnel, the larva walks backward in a circle, boring its abdomen into the sand. A circular hole results. Continuing similarly, but in an ever-narrowing spiral (clockwise or anti-clockwise), it burrows deeper, operating simultaneously as a live excavating machine, for it keeps throwing the soil/sand out regularly with violent tosses of its head. The column of sand that initially stands in the middle grows narrower and narrower at its base, collapses and finally disappears completely. The steplike ridges formed by the larva's spirally descending course are smoothed out by the constant flinging out and crumbling of the sand. If the sand is loose, the wall of the funnel is not made as high and steep as it is in somewhat firmer material. When the trap is completed, the bristly larva lies waiting at the bottom, its almost triangular or trapezoidal body hidden in the sand. Only its long, curved sucking mandibles remain visible (to the sharpest eye only).

The antlion larva often shakes a captured insect violently, or beats it against the wall of the funnel till it's stupefied. The stiff bristles on the larva's body provide the attachment to the ground, needed to handle the usually large prey. If the captive tries to crawl up and out of the funnel, the larva pelts it with sand

and brings it tumbling down.

Antlion larvae live for about two years. Only a few species construct funnel shaped traps; the others run freely about hunting on the ground at night, but by day, conceal themselves at the bases of plants or in shallow burrows in the soil. There they seize and pull down such insects that walk over them. The larvae turn into pupae that remain still and at rest for several weeks.

The hind end of the larva contains spinning glands. When it pupates, the larva spins with its two terminal abdominal segments a round oval cocoon; this most often consists of an outer loose web of silk and an inner denser one. It may be glued together with secretion and it gets a thick coating of grains of sand. The pupa's mandible are longer and in the act of emerging, many pupae use the mandibles to bite the cocoon open.

All in all, antlions are one of the most fascinating creatures in nature.

--Pushpa rekha

Vassaret's Gift outright

the world's end now comes not by ice¹ à la Frost
 nor via the MacLeish freak show finish²
 nor by the triggering of atomic
 reactions nor by push-button
 errors but by the slow
 and easy, easy and
 slow ways of
 ecocide when
 earth water
 fire and
 air are

not. Louis Mann

¹Robert Frost, "Fire and Ice"

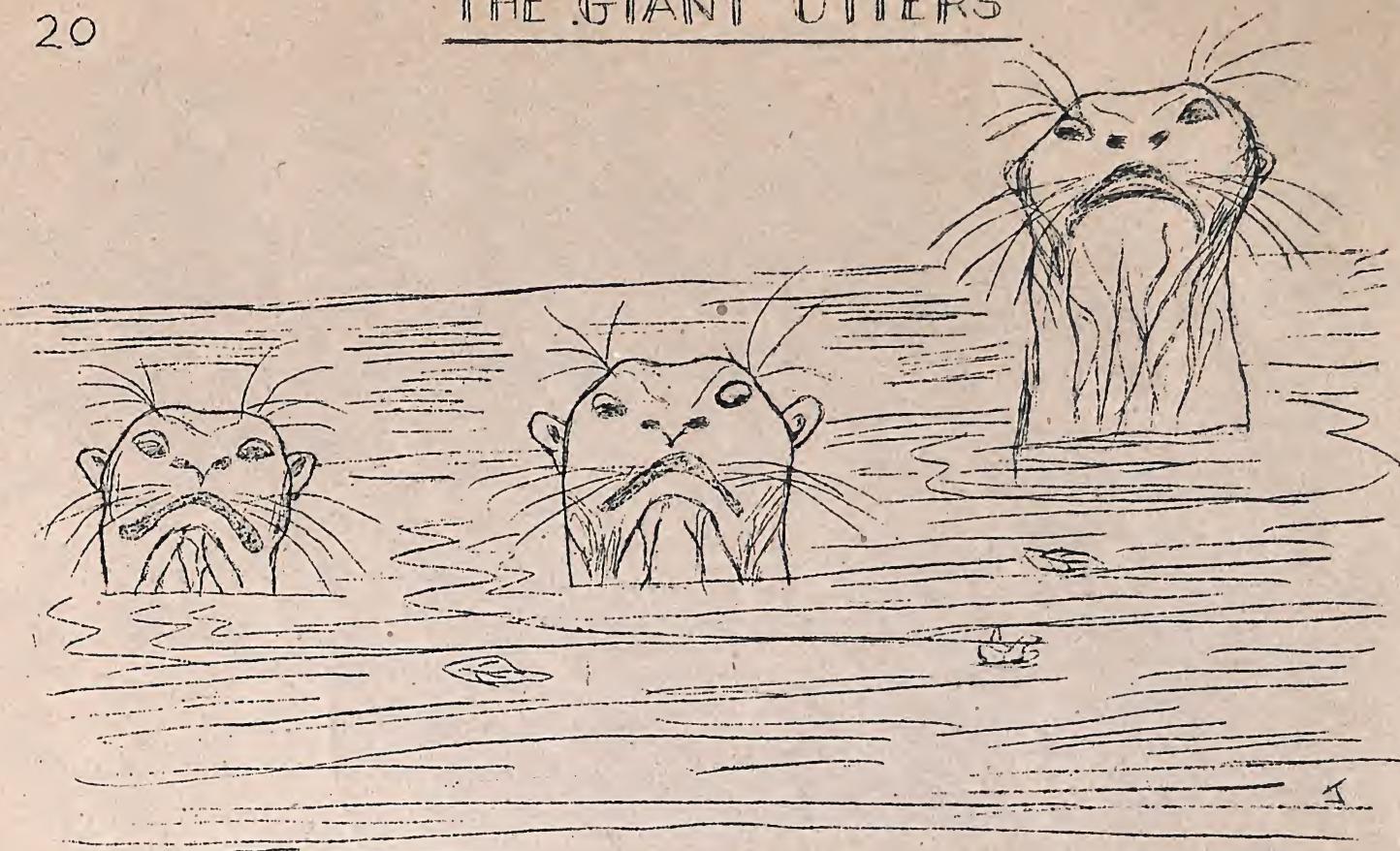
²Archibald MacLeish "The end of the world", Perspectives in Medicine and Biology, 15: 473, 1971

UPON THE DEMISE OF THE LAST HUMAN IN THE WORLD

And the Earth whispered to the stars,
 "Ah, but it was a great adventure!"
 Drew tight its mantle
 And went back to sleep
 The stars, bearing, frowning
 Puzzled among themselves--
 "What was?"

W.J. Hirschfeld

THE GIANT OTTERS



The surrounding is bathed in green, the translucent water beneath looks like a melted jewel of blue. You savour this serene beauty from a large rubber boat sailing smoothly on the waters of Suriname, in South America. Two heads pop up above the blue waters, their tiny round eyes sparkling, tufts of whiskers drooping behind the dark fur. As the boat drifts too close to them, suddenly, with snorts and splashes the otters are gone, leaving only rings of spreading wavelets.

Weighing 60 pounds on a 5-6' frame, Pteronotus brasiliensis, the giant Brazilian otter appears on the world wide list of 23 most endangered mammals. There is every chance of these disappearing within the next 20 years. Hardly surprising, as this conspicuous beast to a man with a gun, brings equivalent of three months wages, with one lucky shot.

Suriname, where giant otters have been protected since 1954, is probably the only place left where they are still a common sight. Otters are active only during the day. Diving into the water, they swim in groups. These noisy species hum, coo or chortle to their young cubs as they swim. Adults and cubs alike scream in frustration when another family member loses the fish they were chasing. In all, nine basic sounds can be distinguished, from a startled "Hah!" to the squeaks of a newborn cub.

Portions of the riverbanks are stripped bare by the otters. Churning up the soil with their paws, a semicircle of 35' long and 20' wide is formed. This campsite, so called for convenience, announce the presence of a family to the others passing by. The residents saturate their campsite with urine & with scent from glands situated in a

pair under the tail. The musky, rank odor can be detected a 100' away.

Every group has a number of campsites on its stretch of river, some sites used frequently, others abandoned after a few visits. Those on territorial boundaries are usually the largest and are visited regularly.



Natives call them "big water dogs". Clumsy on land, they excel in small tropical rivers, where their powerful tails and webbed paws propel them through the tannin-stained waters. Curious yet shy animals, they travel and fish together, patrol territories, groom one another and cuddle in sleep.

The otters feast on crabs trapped in shallow pools by the receding waters. They tread water while eating. Each fish grasped firmly between the forepaws, is eaten head first, crunched like an ice-cream cone. Their favorite prey is a black fish with large scales called the 'pataka'. It furnishes the otters more than half their diet.

The male otters have large heads and thickset necks; the females are of slighter build. They dig dens in the stream banks. Located if possible near good fishing sites, they usually have a single entrance on the stream bank and a rear exit used to escape into the forest. The place inside is just wide enough for a family to curl up together. Cubs are brought up in these dens. The otters mate in the swamps during high water season. The parents share the work of tending cubs. At three months, while still nursing, otter cubs begin eating fish caught by their parents. Within weeks, they catch fish themselves, drag them to the shallows for eating.

Otters are known for their playfulness. The parents and the cubs form a close knit family. If an otter loses its partner, it becomes dull and lethargic. The sparkle in its eye vanishes as it loses interest in life.

A development project has tripled the population in Kapoeri creek (where the giant otters live in Surinam). More people are bound to infiltrate into the jungle. Hence, the peaceful life of the otters would be jeopardised.

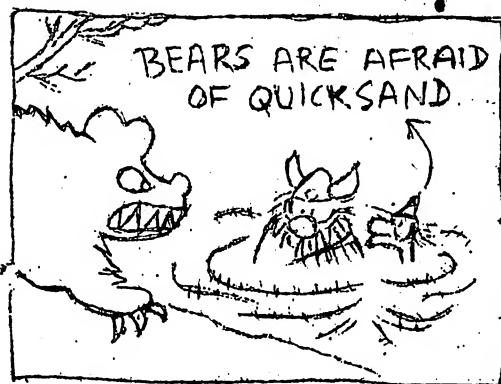
An excellent nature protection system established by STINASU (The Suriname Nature Conservation Foundation) have plans afoot to protect the Kapoeri creek. The giant Brazilian otters are a species that must survive.

Vinutba J.

QUICKSAND

22

HÄGAR THE HORRIBLE



Quicksand exists in many parts of the world and is one of Man's oldest nightmares. To be trapped in it seems a peculiarly hideous way to die. Actually their danger has probably been exaggerated in the popular mind by sensational descriptions in works of fiction eg. in Sir Walter Scott's The Bride of Lammermoor and Wilkie Collins' The Moonstone.

The present understanding of the phenomena of quicksand stems from certain experiences in World War II. During the 1944-45 invasion of Germany, Allied armies discovered that they needed a lot more info on how to move troops over unstable soils.

The American Army's interest sparked a number of scientific studies on quicksand. One such studies was conducted by Dr. Smith, Geology Professor at Indiana's Depuw Univ. Smith scooped up a bucketful and later examined samples of the sand under a microscope. The grains turned out to be an ordinary mixture of shapes- some were round but most were jagged (not lubricated). Though Smith kept his sample of sand moist and the green algae continued to thrive, the sand wasn't quick any longer. It was just as firm as beach sand.

Back in the pasture, Smith talked to the owner of the farm. "Funny thing about that stuff," the farmer said, "Sometimes it is quick, sometimes it is firm. Come back in August and you'll be able to dance on it. August- the dry month. So Dr. Smith knew, it was something to do with water, not in the amount of water but in its flow because moist sand supports weight as well as dry sand. To settle the question, Smith and several others built experimental devices in which water could be made to flow through sand in various ways.

One of the most sophisticated models was built by Prof. Jorg Osterberg of Northwestern Univ. His device was a large tank filled with ordinary sand and equipped with hose connections so that water could be made to flow in at the top and out the bottom, or vice versa. To complete the experiment, there was a plastic dummy filled with lead shot so that its specific gravity was roughly the same as a man's-- that is, it floated in water, with the top of its head above the surface.

When the tank was dry, the dummy could be placed in

standing or lying positions on the surface, barely making a dent on it. When water was forced into the tank from the top, the dummy would still not sink. But when water was forced into the tank from the bottom, welling up through the sand, the dummy sank to its neck. Upwelling water, as from a spring, forces the grains apart slightly and makes the sand mass swell. Each grain then rests partly on the cushion of water instead of solely on other grains.

Researchers found that the finer the sand, the slower the upwelling of water that is needed to make it quick. With fine sand and a fast upward flow of water, the result is a "super quick" condition. A human being sinks into it immediately, though it may look as firm as concrete. When the water flow is slow or the sand grains are coarse, the result is slow quicksand. One can take a few steps into it, and usually is still able to turn around and get out.

If a person does not sink immediately in quicksand, and keeps his head, he may still be able to float in quicksand as in water. Since quicksand obeys the laws governing the displacement of liquids, a body will sink in the sand only if it displaces its own weight in liquid. But, since the density of the sand-water suspension exceeds that of the human body, the body cannot sink below the surface.

How to escape from a Quicksand

If you ever get caught in a quicksand, try to follow these rules:

First : Don't panic. Quicksand seldom kills its victims.

Second: Warn off companions. You might need their help.

Third : Get rid of packs and items that can weigh you down.

Fourth: Lean backward in a spread-eagled position. This should allow you to float , as your density now is less than the combined density of the sand water.

Finally: Gently squirm or roll your way toward firm ground.

Carrying a pole when walking in suspected quicksand areas would be preferable for use as a rescue aid (Subbaramya, our ornithologist, once escaped from a quicksand, thanks to a walking stick that he was carrying against stepping on snakes).

Jayanthi R.

RAHAB MECHEN



"OH, YEAH ? WELL, I HAPPEN TO BE QUOTING FROM EITHER 'NATURE'
OR 'NEW SCIENTIST'."

WEIGHING IN SPACE

How does one measure body weight in outer space? Since objects of any mass are equally weightless, earthly scales do not work. However, weighing is vital in space. The longer the flight, the more insistent are medics on monitoring the cosmonaut's weight.

A Cosmic Massmeter is based on a different law of physics from the one that governs weighing on earth. It is known that the period of free oscillations of a once swung pendulum depends on its mass. However, this formula can be applied in reverse: the mass of a body is proportionate to the squared period of oscillations.

The structure of the massmeter is comparatively simple. A small platform rests on top of two cylinders, one inserted inside the other. The cosmonaut lies face down, chest on the platform, chin resting on a pull-out support, feet on special foot holds, hands on handles. The touch of a trigger releases a pre-compressed spring placed inside the cylinder. When the spring recoils the platform along with the cosmonaut oscillates in one direction. When the spring is partly constricted again, the platform oscillates in the opposite direction.

The oscillations gradually slow down, but even 30 seconds are sufficient to measure the mass of a body and the period of oscillations with an accuracy of up to one thousandth of a second.

The data is transmitted to an illuminated indicator board. Following a special table, the cosmonaut himself or the ground service of flight control then translates the figures into kilograms.

-- Vasudev

Mania, used here as a combining form, means a madness, sometimes a hatred. Match the madness on the left with the cause, type or subject on the right.

- | | |
|---|---|
| 1. Arithromania
2. Bibliomania
3. Dipomania
4. Dromomania
5. Kleptomania
6. Megalomania
7. Monomania
8. Mythomania
9. Pyromania
10. Trichotillomania | a. Fire
b. Impulse to steal
c. desire to pluck one's hair
d. preoccupation with numbers
e. lying and exaggerating
f. delusions of grandeur
g. craving for alcoholic drink
h. books
i. "running about", wandering
j. irrationality on one subject |
|---|---|

(Answers given below)

LIGHT THERAPY

25

There are different kinds of light waves. But for skin care and beauty, only three of them are important. They are, infra red rays, ultra violet rays and visible light.

Infra red rays produce soothing effect and signs of first degree sun burn. It relaxes the skin without increasing the temperature of the body, dilates the blood vessels in the skin and increases the production of perspiration and oil. The length of exposure should not exceed 5 minutes and the distance from the source lamp should be more than 30" while application.

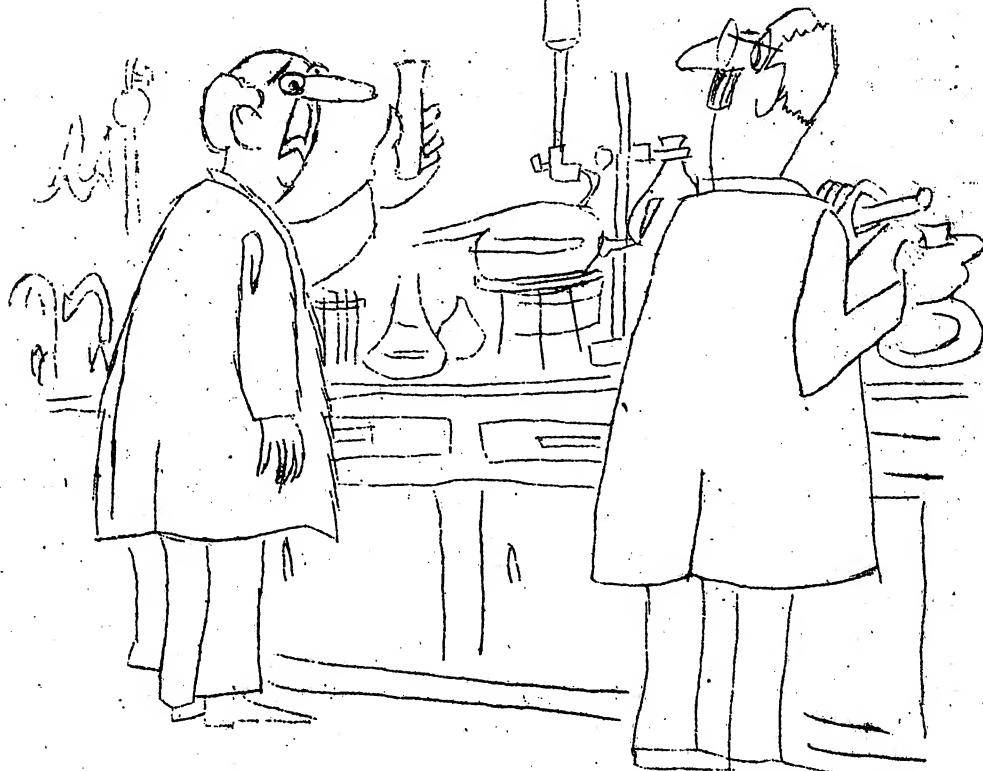
While infra-red rays produce heat, ultraviolet rays produce germicidal and chemical reactions. UV rays stimulate the activity of body cells and increase the iron and Vit D contents and the number of red and white cells in blood. Skin should be exposed at a distance of 30-36" away from the UV lamp, for 2-3 minutes. UV rays are used for acne and combating hair dandruff. It also promotes the healing of hair as well as their growth.

The lamp used to produce visible light is usually a dome shaped reflector with the lamp in various colors. The blue light has a tonic effect on the bare skin. Red light has strong heat rays which has a stimulating effect when used over the skin. It is recommended only for dry and scaly skins.

Now that many lamps producing all these rays are available in the market, a few points have to be borne in mind during use :

1. Eyes must be protected against the glare and heat of the rays
2. Skin must be thoroughly cleansed before therapy. Creams, oils and powder must not be present on the skin.

Vinayak K.



"WHAT IS THE OPPOSITE OF EUREKA!?"

TOPICAL THERAPY
TOPICAL THERAPY
There are different kinds of light waves? But for skin care
there are only three of them are important namely infrared rays,
ultra violet rays and visible light.

Infrared rays produce soothing effect which is good first
thing in the morning. It relaxes the skin without increasing the tempera-
ture of the body, dilates the blood vessels thus reducing the tempera-
ture of the body, stimulates the production of perspiration and oil. The length of exposure should
not exceed 5 minutes and the distance from the source lamp should be
more than 30' while application.

While infrared rays produce heat, ultraviolet rays produce
various forms of光子 therapy. These rays help in the
obliges the body to increase the iron and Vit D content and number of
white blood cells. Skin should be exposed at a distance of
30-36" away from the UV lamp for 25 minutes. UV rays are used for
combating hair dandruff. It also promotes the healing of hair
of the scalp and combatting hair dandruff. It also helps in the removal of the hair
of the scalp as well as their growth.

The lamp used to produce visible light is usually a dome
shaped reflector with the lamp in various colors. The blue light has
a tonic effect on the bare skin. Red light has strong heat rays which
has a stimulating effect when used over the skin. It is recommended
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Now that many lamps producing all these rays are available

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1. Eyes must be protected against the glare and heat of the rays.
2. Skin must be thoroughly cleaned before therapy. Creams,
oils and powders must not be present on the skin.

WHAT IS THE OPPOSITE OF EUREKA?

ANSWER : DILEMMA

WHAT IS THE OPPOSITE OF EUREKA?

WATER SPIDER



AIR BUBBLE

Into the watery depths plunges the tiny diver. Instead of carrying an Aqua-lung, he wraps a glistening bubble of air around his abdomen and its breathing pores. As he reaches the bottom, his eight myopic eyes sight a shadowy movement. Lunging, he seizes the quarry - an inch long rainbow guppy. Injecting venom with his fangs, he kills the fish. Later, he will devour it at leisure in his submerged home.

This little swimmer, is one of the most unusual among the world's 30,000 known species of spiders. If any animal ever defied Nature and got away with it, then it must be this. This eight legged aquanaut (Argyroneta aquatica), is found only in Europe and Asia. It is perhaps the only spider living under water. It lives almost its entire life beneath the water, building air-filled domiciles in which to dine, sleep, and even batch its young.

Underwater, spinnerets quivering excitedly as they extrude fine, almost invisible, silken strands, he races from one plant stem to another and back again. As he continues and completes the grand design ; a fine meshed net of silk, anchored to plants (or any other stable object) by slender threads.

As he climbs from beneath his creation, he shucks off most of his bubble of air which bobs into the web, buoying its middle. Swimming to the surface, he gives a flip, and traps another air bubble. The silvery globule clings to his hairy rear legs and abdomen by capillary adhesion. Pulling himself down preset silken guy lines, he deposits this second bubble beneath the web, where it merges with the first. This bubble which is released is the extra bubble ; in addition it always its personal bubble beneath its abdomen, for breathing under water. The spider deals with air as if it were a commodity, like a builder-measuring-aceement, it measures out and carves hair into portable portions.

After several more trips, the web balloons into a kind of bell or dome, open below. Then he moves into this air-filled retreat. In the lakes and slow-moving streams, these spiders build summer and winter bells, moulting bells, and breeding bells with a sealed off upper storey where the eggs hatch. Of course, all this water must be of their natural environment required by these spiders.

Habitat : His under water habitat finished, the spider dwells head downward within it; his forelegs poke through the open underside and rest on guy lines. The irregular far-flung web does not actually capture a prey, but it does transmit vibrations to the waiting spider whenever an enemy or a potential victim brushes a strand.

The male has leg-like feelers to help in mating while the female has abdominal openings. Half again as large as she is - the female - the male is a mere flyweight.

Contd. on pg. 45



TREK TO EAGLE'S ROCK

27

Sunday, Sept 4, 1983...

The smash success of the trip to Hosur Caves (July 24) inspires us to plan for another trip. And we decide to go on a trek to the top of Eagles' Rock hill today. This is supposed to be a 3-in-1 trek (nature, archaeology and cave study), according to the organisers (who had trekked before through Bannerghatta side).

We² assemble in Kalasipalyam at 0900 hrs. Subramanya and Belavadi could not join us due to prior commitments. We would miss them badly during the trek. It is a cool, cloudy morning. It has been raining the week long. We are apprehensive about rains ruining our program. But yesterday, our official weather forecaster had allayed our fears about rains by giving a 5 to 1 odds for rain during the trek. We hope that he is (as usual) right.

Our destination is Kosur, a village near Eagle's Rock (ER). Kosur is also known as Mariyapura/Thatteguppa, about 25 km from Bangalore. We board the BTS bus. After 20 km, the bus turns left from the Kanakapura road and enters a kutcha road. It slithers precariously through the wet dirt track. The ponds and ditches beside the track are filled with light brown rain water, like giant cups of tea. The 45 minutes trip is unexciting.

We reach Kosur at 1000 hrs. As we alight, the distant silhouette of ER (about 5km away and 1000 ft high) looms before us. Looking at it, there are audible gasps and eyes widen with questions. "What? so far? so high?", sighs of doubt and dismay. Many of us think that we would never make it to the top and back. But we are wrong.

From Kosur, we trek to the base of ER on the bullock cart/cattle/elephant track. Veenakumari locates her study material -- elephant dung which is strewn in plenty on the track. We help her to dig out some dung beetles for her study (refer her report). US and KNG lag behind, collect plants belonging to the Phyllanthus sp., for one of their research papers they are currently working on.³. Eswar keeps clicking his camera, catches us (for posterity) in diverse moods of laughter, musing or just tired.

The locals we meet in the adjoining ragi fields are amazed that we would be crazy enough to traverse through the forest on our ascent to the top of ER. Especially, when only yesterday, herds of elephants have trampled on that trail, after a romp in a nearby tank. But we of SF know no fear (none of us had yet seen a wild elephant, let alone a herd), so we thank them for their concern, but plod on, on the same trail.

After an hour, we reach the base. We stop for a while to relax. But we freeze, as we realise that we are in an illicit liquor distiller's territory. The rain water in the ditches around us is black, without doubt, polluted by the moon-shiners dumping the waste products in it. The moon-shiners are agitated at our abrupt, unannounced and unwelcome invasion, and that too, with incriminating cameras. They keep suspicious looking sentries posted along our trail, to watch our movements and intentions. It is a comic Catch-22 situation. They are alarmed by our intrusion and we are scared of them. Finally, we put on our famous innocent naturalist's face mask and trek on. The

* I am forced to type this article in single-space, as the author chose to exceed the limit set for the length of a tour report - Ed.

¹ Eagles' Rock is a hill (actually, Doddaragiballi Betta), adjoining the Bannerghatta forests and ranges, and can be reached by trekking through either Bannerghatta forests or from Kosur, a village near Kanakapura road. Normally, a roosting place for the eagles and hence the name ER.

² Bhagya, Eswar, Ganeshaiyah, Gopalkrishna, Jagannath, Jatinder Singh, Jayanthi, Nadana Sigmami, Pushparekha, Sarala, Sridhar, Suresh, Uma, Uma Shaanker, Usha, Veena, Veenakumari and Vinutha.

³ Incidentally, the paper on Phyllanthus has been recently accepted by Current Science, for publication.

sentries keep their vigil till we leave their area. Then, we relax.

Now, we walk into the megaliths (refer article in this issue). . . KNG and US give an impromptu talk on these interesting historic stone structures. We enter the forest for the ascent. The forest is dense, humid, eerie. We feel thirsty as the few water flasks that we had were emptied an hour ago, to the last drop. But KNG & NS keep promising the tired, sweating group of a nearby crystal clear brook. After half an hour, with throats parched like sand paper, we feel that the brook is just another promise of theirs, a mirage. But, to our pleasant surprise, we reach it!

True to the description, it is a clean, cool brook. It has a miraculous effect on us. The tired dusty faces light up with joy and wonder at this rare sight of the serene flowing water between the tall trees that are guarding it jealously. We drink the sweet water up to our neck and splash it on our body. Some wander up and down stream, some fool in the water, the rest just repose on the boulders, under the shade, with water tickling their toes.

We reluctantly leave the brook, half an hour later. The toughest part of our ascent unfolds. We are out of the forest and the terrain is steep, rugged and slippery (due to moss). Our pace competes with that of a snail's and lags behind. As we puff and puff while climbing, who do you think we bump into, as we near the top? No, not eagles (they are elusive today), but goats!! Looks like it is a grazing place for them, once in a while, as there many grassy patches near the top. We regain our composure. If goats can climb so high and still manage to look fresh and springy, we feel that the ascent is easy for us too. The few who complain over the tiresome climb now stop bickering and climb with inspiration. Finally, we make it to the top at 1300hrs.

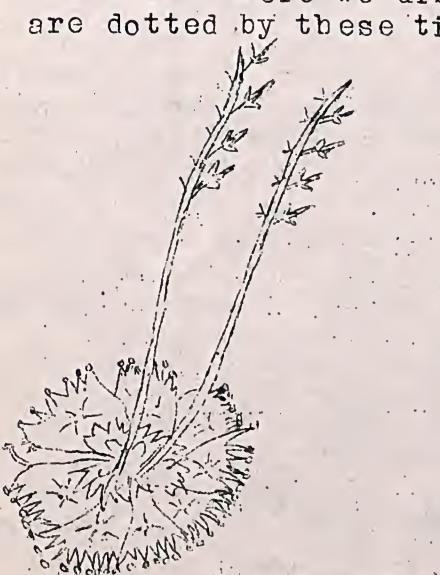
The top of ER is a .. plateau, wide and flat. The view from here is glorious. Miles of lush green fields spotted with brown tanks, striped with bullock cart tracks and blistered with scattered tile houses, carpet the land beneath our feet. The clouds mat the sky to the distant hills on the horizon. Numerous tall cacti stand here, like sentinels for this bewitching scenery.

Small pools of water, in the depressions between rocks, like jagged pieces of mirrors, reflect the sky and the clouds. Some of them have small yellow profusely flowering water plants. It is such an enchanting sight that someone breaks out of the silent spell that these scenes have cast up on us and exclaims,

"Ayyo, eshtu chenragithe, nodi !!!". A perfect description of the scenes around and from the top of ER.

Here we discover the Drosera sp. The green grassy patches are dotted by these tiny red colored plants (D. burmannii*). It lasts from August to March. A terrestrial insectivorous herb, Drosera (Gr. droseros, dewy from drosos, dew, juice) leaves are covered with bristle like hairs ending in glandular tips. If an insect settles on the leaf, it gets caught amidst these glandular hairs, since a sticky juice is secreted by the glands at the tips of the hairs. It is found from W. Africa to N.E Australia. In India, it is common in wet meadows in plains and upper Ghats.

But what surprises us is that this plant is supposed to be 15 cm tall, while the ones here are so small (< 2 cm) that we have to lie down on the grass on our stomachs to see them clearly. We hypothesise that probably it has just started growing (from August) and may attain its normal size after Oct-Nov. Or, we feel, that this is growing in a nutrient depleted, poor soil (which is hardly 4-6 inches thick), so it is

D. burmannii

unable to realise its potential size for that age. Many of us see ants trapped in the tiny leaves, some of the ants dead, others entangled and make futile attempts to escape. Unfortunately, none of our three "expert" photographers manage to get a snap of it ('technical problems', they tell us later).

Then we come across the half built (3 ft high) fort-like structure (where eagles are supposed to roost). This fort does not seem to have been done in a haphazard way. It has a distinct design and a watch tower (also incomplete). What intrigues us is that why was it abandoned, uncompleted? The wall is built with undressed stones. The stones lie in perfect order-- no sign of violence. It looks as though it was abandoned without putting a piece of stone out of place. We speculate on all possible reasons- mutiny of the construction workers, famine shortage, war, involvement of ET's. But the only plausible one seems to be the simple one suggested by Mr. Mohammed Akbar, a Forest Range Officer in Bannerghatta¹ (whom US and NS had met sometime back).

According to him, a plague or some fatal infectious disease must have broken out during the construction of the fort and the people fled. We reluctantly agree that it might be a reason (unless a more factual one is forwarded). A serious trek exclusively for the study of this fort is planned for Nov-Dec.

After the survey, we share the lunch and as usual, there are more breads than butter-around - most of the guys bring bread and jam. The girls circulate their home/mess preparations, both products are highly appreciated.

After lunch, the fagged out souls take a siesta. Veenakumari keeps on digging for the beetle. Some wander around, exploring the plateau. Others gaze at the stretches of land and water. US et. al (.Trek's Tea Co.) start preparing the brew. Unlike at Hosur Caves where they upturned and spilt the entire tea into the burning firewood, here they miraculously succeed in their very first attempt!! Absence of one of their et. al is supposed to be the reason for their unusual success. The tea is good indeed.

The post-tea discussion centers around SF activities, suggestions and criticisms are noted for future reference.

An ant lion is discovered by Pushparekha (refer her article) and its larva is scooped out of the trap. Many members observe this unusual insect for the first time and are fascinated by its trap.²

But the object that mesmerises everybody is the tunnel or burrow of a trap-door spider, that Jayanthi discovers. This trap door is so well camouflaged that she would have overlooked it, but for a tiny movement of the trap door. The insides of the burrow and door is lined with silk and is smooth. It is a very interesting mechanism.³ However, no matter how hard we try, we are unable to force the spider

¹ It never materialised

² Now in Chickmagalur

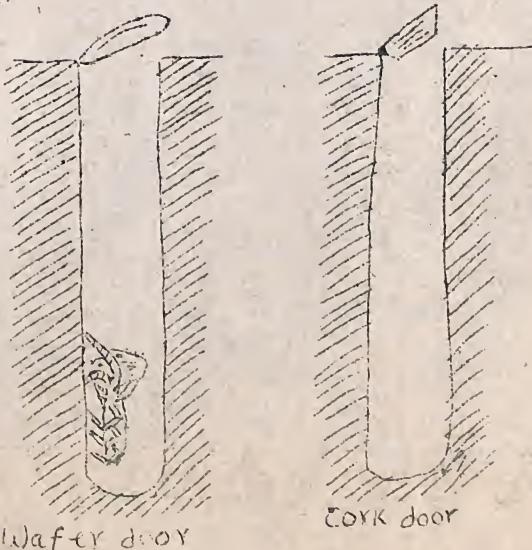
³ Few of the then fascinated members are now seriously working on ant lions in campus and at Sangam

⁴ These spiders belong to family Ctenizidae and are the most accomplished and gifted artisans. It was first described and illustrated by Patrick Brown in

1756. But it was J.T. Moggridge who in 1873, published his careful studies on the habits of these spiders in Harvest

Ants and Trap-Door Spiders, a book still considered by many as a classic. The one we observed in ER was a simple tube (fig), with a thin or "wafer" door (one of Moggridge's four

(footnote continued in the next page...)



to come out of the burrow.

We begin to descend as it is now 1600 hrs. We locate the cave on the slope of the ER. Inside, it is large and pitch dark. We switch on two weak torches. It is about 20 ft wide, 15 ft high and 25 ft long. We flash our torches on the walls, hoping to discover some primitive man's graffiti. But we are disappointed as the walls are black, oily and sooty. There are idols at the dead end. So this is actually a temple. We see an extremely narrow tunnel on the right side of the idols. This tunnel is inclined upwards, blocked at the mouth partially, by two jutting rocks, from either side. It is studded with sharp stones on the floor and precariously balanced outcrops overhang on the roof, (which is hardly two feet above the floor). The tunnel then led to a small cozy chamber where bats blink at us from the walls, annoyed by our probing torch light from the mouth. The tunnel can be entered by only one person at a time and that too, in a peculiar spine-twisting, face above, on-the-back crawling technique (because of the rocks at the mouth and the upwards inclination).

This is much more challenging than Hosur Caves and some members (esp. few girls), who are expert cave crawlers, wish to crawl into the tunnel. But the organisers forbid us (as they had crawled through before on another trek and they claim that it is very risky and time consuming). Spoil-sports, they are. Reluctantly, from the dark, we come out into the late afternoon sunlight.

We continue our descent back to Kosur. This is easy and none lag behind. At one place in the confusing scrub, KNG says, "We go right", and US insists, "No, we go left". We are confused as to whom to follow and think of voting, when out of the blue, one member (with brains/agility of the ape) scrambles up the nearest tree, squints into the distant, spots the tall steeples of the Church at Kosur and growls, "Go right", We do.

Looking back at ER, Vinutha happens to spot what looks like a megalith precariously placed on the flat face of ER. This is noted by a few members, for further exploration at a later date.

We plod on our tracks, trade jokes. The only brief excitement is provided by Singh who got lost and was found again, by yelling his name through the scrub for 20 minutes. We are shown "Elephant Rock", christened by KNG, as "it bears a striking resemblance to an elephant". Most of us feel that it can "resemble" an elephant, only if your mind is also blessed with the power of surrealistic imaginations. We reach

----- (contd. ^{next} pg)
distinctive types of nests). This spider makes a hole into the earth with its fangs. It cuts and scrapes the earth, molds soil particles into balls and carries it out of the burrow. These spiders then water proof the walls of the burrow by applying a coating of saliva and earth, so that the surface becomes smooth and firm, then line the walls with silk. The wafer door is made up of layers of earth and silk and is also lined with silk from the inside. From outside, the binged door is indistinguishable from its surroundings. It is the fitting and thickness of the wafer door that makes it different from the other type of door-'cork door'. The wafer door has an outside circular flange that overhangs the aperture of the tube, while the thick cork door perfectly fits the tube 'like a cork'. The spider is nocturnal. The door keeps away the heat and rain. The burrow becomes the mating chamber at the proper season and as a nursery when eggs are laid. Later, the young spiderlings spend in it many weeks, after emergence. But what is really exciting to watch (if you are lucky) is the fight between this spider and its arch enemy (predator), the various wasp sp. of Pompiliidae. After lifting the trap door (overcoming ^{keek} severe resistance offered by the spider which pulls the lid down), the wasp enters sting first, stings and paralyses the spider and deposits on the spider's abdomen an egg, from which will hatch a voracious larva, later. One saturday afternoon in campus (after a SF meeting), a few of us watched this bitter fight for an hour, in which the wasp emerged as the victor. For further details, read "The Life of the Spiders" by John Crompton, and "American Spiders" by W.J. Gertsch -- Ed.

DUNG BEETLES

31

After a barrowing bus ride, the morning of the fourth of September, 1983, saw us (a small well-knit group of SF members) at Kosur. Of varying ages and differing interests, we began our trek to the top of ER. During the course of conversation, it became evident to everyone that I was on the look out for dung beetles for my research. There were dung pats galore all along our route and it was not uncommon to hear some one or the other calling out to me, informing me about the presence of a pat *. Though ubiquitous in their distribution, the dung beetles are virtually unknown to many.

Working diligently but in anonymity beneath dung pats, they remove enormous amounts of dung from the surface of the soil, thus facilitating speedy decomposition. It is staggering to imagine the magnitude of the work that they do. Most of us fail to realise that in their absence we would have been facing the acute problem of "waste" disposal. The Australians have learnt this at a great cost to themselves when they unthinkingly took along cattle, sheep, pigs and goats to their isolated island without the accompanying beetle fauna.

Dung beetles belong to the family Scarabaeidae and the sub-family Scarabacinae. During our trek I was able to collect them from both cow dung and elephant dung. Various species of Onthophagus viz. O. gazella, O. duporti, O. dama, O. pygmae were present in large numbers. In addition there were a few species of Sisyphus fashioning spherical balls out of fresh cow dung, oblivious and unmindful of our presence. The openings of the nest of Copris sp. were also observed, in the zest to proceed with the trekking, I was forbidden by others, from digging down the burrows to unearth the beetles.

Elephant dung revealed a varied beetle fauna comprising of the following sp., Helicocoris gigas, Catharsius molossus, Capris signatus, Tinicellus sp. In one instance, I was shown a lot of consideration and was allowed to dig up one Helicocoris gigas, at a depth of one foot.

Apart from these, 3 species of ants, 3 specimens of Anthia sexguttata (Carabacidae) were also collected. Some conical pits formed by ant-lion larvae belonging to family Myrmeciontidae were also found right on the top of ER.

-- Veenakumari

* One enthusiastic member got carried away in the spirit to spot the pats that he/she (we forgot who it was) shouted out excitedly, "Hey Veena, here's elephant cow-dung !" !! - Ed.

contd. from previous pg.

Kosur at 1830 hrs. We miss the 1815 bus. We wait in the dark. Rain clouds conspire above us. The BTS bus finally arrives at ~0000 hrs (answering many a member's desperate prayers). By the time we reach back to our respective places, in Bangalore, it is 2300 hrs.

It is a trip we'd not forget, for a long time. Esp., our weather fore-caster, would not. After 0100 that night, we received 64 mm of rain, the heaviest during the season...

SF HIGHLIGHTS 1983-84

Now
It is more than a year since Science Forum came into the Campus scene. In this short sum-up, the highlights of the year that was, is encapsulated.

TALKS, 1983

4 June	Dr. Rajegopal	Termites
11 June	Uma Shaanker	Selfish Genes
18 June	Dr. Devegowda	Alcoholism
25 June	Jayakumar	Theory of Relativity
	Nadana Sigamani	Chance: How to reduce it
2 July	Dr. Bhagyaraj	Research in New Zealand
16 July	Eswar Prasad	Photography
23 July	Capt. Gurung	Hang Gliding
30 July	Group Discussion on IQ	
1 Oct	Srikanth (IISc)	Magnetotactic Bacteria
8 Oct	Laxman Rao (Bang. Univ)	Vegetation in Coastal Karnataka
15 Oct	Dr. Vasanthi	Wildlife in India
26 Oct	Dr. W. D. Hamilton FRS	Sociobiology of Bizarre males in fig wasp
29 Oct	Prabhakar Rao	Agriculture in America
12 Nov	Dr. Jagannath	Rabies
19 Nov	S. Subramanya	Birds in India
26 Nov	Ganeshaiah	Sexual Selection
24 Dec	Nadana Sigamani	Why do lizards store fat only in their tails ?

1984

28 Jan	Film Show ("White wilderness", "Spring comes to Wentroux")	
4 Feb	Dr. Sharat Chandra	Disturbed habitats of N. Eastern hills
11 Feb	Radhamani	Why do bamboos take so long to flower ?
18 Feb	Vijaya Shri	Applications of Tissue Culture
25 Feb	Belavadi	Digger Wasp
3 Mar	Vinayak	Interferons
24 Mar	Ganeshaiah	Many moods in Meteorology
31 Mar	Suresh C. K	Memory in Bacteria
7 Apr	Prashant	What is a species ?
21 Apr	Mahan Kumar	Solar Energy
28 Apr	Vinayak	Fibonacci Series
5 May	Film Show (Mathematics of Honey Comb", "DNA")	
12 May	Dr. Parthasarathy, FZS, Macaque Monkeys	

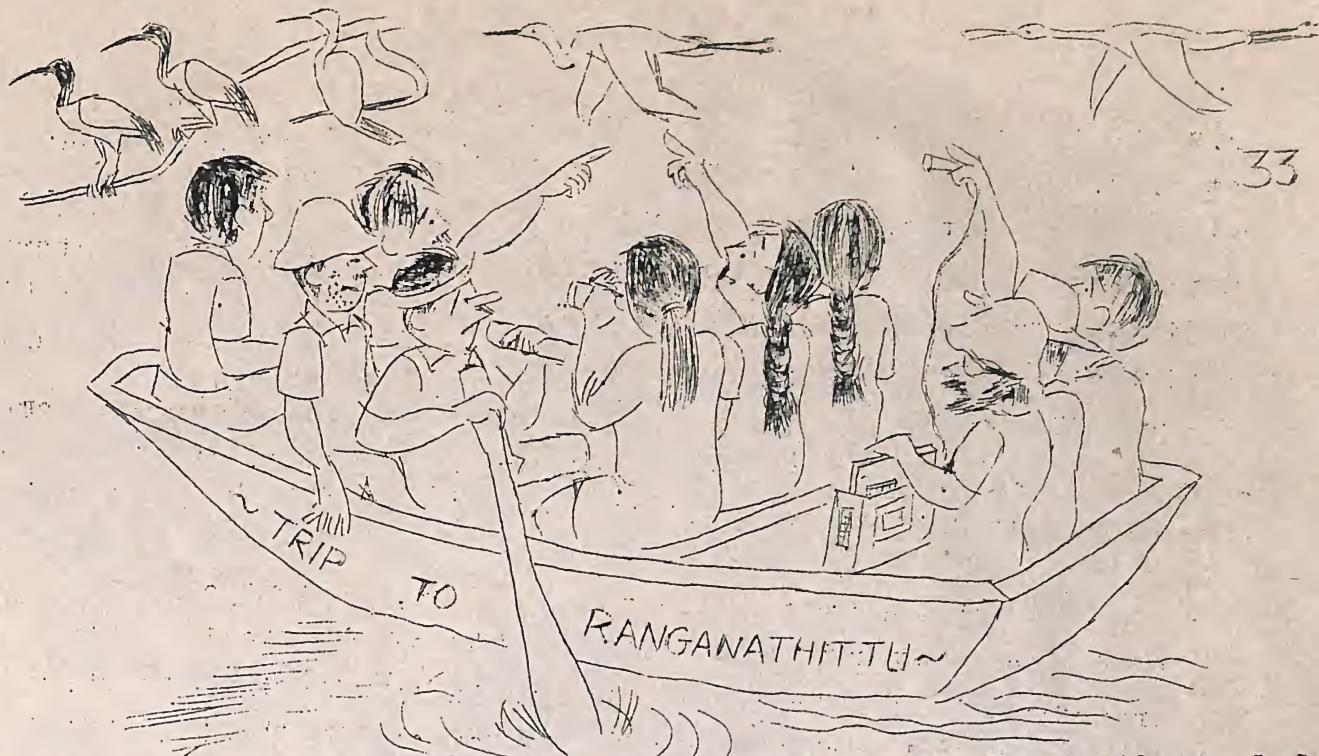
TOURS/TRIPS/TREKS

25 May 1983	Nandi Hills	19 Nov 1983	Aquarium
10 Jun 1983	BR Hills	22 Dec 1983	Mangalore
24 Jul 1983	Hosur Caves		
4 Sept 1983	Eagles' Rock	3 Mar 1984	Makali Durga
7 Oct 1983	Ranganathittu	17 Mar 1984	Maddur to Kokkare Bellur

BIRDWATCHERS' CLUB

One of the best things to come out of SF is the Birdwatchers' Club. Inspired by our ornithologist (SS) this chapter of SF was started very recently, in Feb 1984. Once in every fortnight, the members of BC visit some locality, sight birds, make notes and discuss. There are now members who can identify more than 40 sp. of birds. And the flock in BC is increasing as fledgeling members join the old 'core'. Following is the brief detail about their outings and number of sp. sighted.

31 Jan	MRS & UAS Wetlands	43	14 Mar	MRS & UAS Wetlands	50
5 Feb	MRS	54	17 Mar	Maddur to Kakkare	73
17 Feb	MRS & UAS Wetlands	30	1 Apr	Bellur	45
29 Feb	Lalbaug	33	6 May	Lalbagh	56
				-- Vijaya Sri	



The much intended and planned trip to Ranganathittu had been postponed for quite sometime. But when the threat of the breeding season of the birds coming to an end bore down upon us, we hurriedly packed our bags on Oct 7, 1983, for a 21 hour long trip, to this perhaps ^{the} most beautiful bird sanctuary of India.

Our team consisted of Gopalkrishna, Jagannath, Jayanthi, Pavitra, Sudbarshana, Suresh, Vinayak, Vinutba and myself. We got into the Bangalore-Mysore passenger train at 10.45 p.m. and found our reserved seats being allotted to others by a very obliging TC, at a throw-away bribe of a Rupee per seat. ^{No sooner had} We settled down after convincing the TC of our rightful occupancy ^{that}. Jaggi started to explain to us the delicacies of the 'hot idli and coffee' that he was going to have at Srirangapatnam station. But he got thoroughly disappointed when the TC said - 'Idlinu sigolla, gidlinu sigolla'!!! While most of the members played cards, keeping the whole bogie alive with chattering and laughter, Jaggi decided to sleep through the journey (probably to dream of hot idlies!).

We disembarked at S. patanam around 4.10 a.m. Jaggi who had blackmailed a ticketless farmer carrying a bundle of sugarcane into giving him a piece of a cane, started to chew it earnestly, stating that it was a better way to clean teeth and gums. Soon we set off in the direction of the receding tail lights of the train, and crossed a dangerous stretch of bridge over the river Kaveri that demanded all our attention. As we stepped on the firm road finally, we put off our torches and let the darkness engulf us. We moved in that pre-dawn calmness, interrupted only by the cheery stridulations of crickets. With cool air brushing our faces, we stopped at a few places to watch the roadside bushes being lit up by scores of fire flies (Lampyrid Coleopterans). Since Vinayak wanted some for his Entomology course, we picked up a few. We also sighted an owl that did not stop by to let us identify it.

We reached the sanctuary premises by 5.10 a.m to find

Dr. Salim Ali's message at the entrance, heralding the benefits of bird watching. With the watchman who followed us right in giving quite a fright to the girls, we parked ourselves in the spacious watch tower. While most us decided to sleep through the next hour, Suresh started to fiddle around with his sound recording system which, much to his anguish failed to oblige. Our arrival must have disturbed the Collared Scops Owl which started to hoot an interrogative wut-wut every two or three seconds, from the canopy of a Pongamia tree, but it promptly shut up as Suresh's recorder started to produce all sorts of strange noises.

As the surroundings brightened up, we went over to the water edge to be overwhelmed by the beauty of the ghostly shapes that had transformed into bird packed islets in the flowing Kaveri, reminiscent of snow clad Christmas trees--as someone in the team put it. With the visibility improving every minute, our binocs picked up the clear shapes of darters, cormorants, ibises and egrets. As the local population of Flying foxes (bats, Pteropus giganticus) started to return from their nightly stroll, the birds started to leave the islets in small flocks to their distant unknown feeding grounds. Soon, we were taken around the islets by an obliging boatman and we could see the birds at close quarters. There were the white ibises with their black down curved bills; the snow-white egrets looking as though they were right out of the dry cleaners; the serpent-necked darters; the dumpy short necked cormorants; the openbilled storks with a slit in their odd shaped beaks and the majestic spoon bills tending their hungry young ones. A feeling of helplessness crept over me as I took stock of these spatulate-billed specimens. From what had once been a population of 12 pairs in 1978, their number had dwindled to a meagre 4 pairs...

Later we camped at the far side of the sanctuary on the platform with a flight of steps that led down to the water edge, to clean and refresh ourselves. By the time we got around to finish our breakfast, we had seen a pair of usually very shy white breasted waterhens that strde into our view; a pair of skulking crow pheasants; a whitebreasted kingfisher and a Red whiskered bulbul that perched quite close and let us have a good look at its form and color. Besides, there were few metallic green damsel flies (Zygopteran odonatans) which stirred quite an interest amongst us.

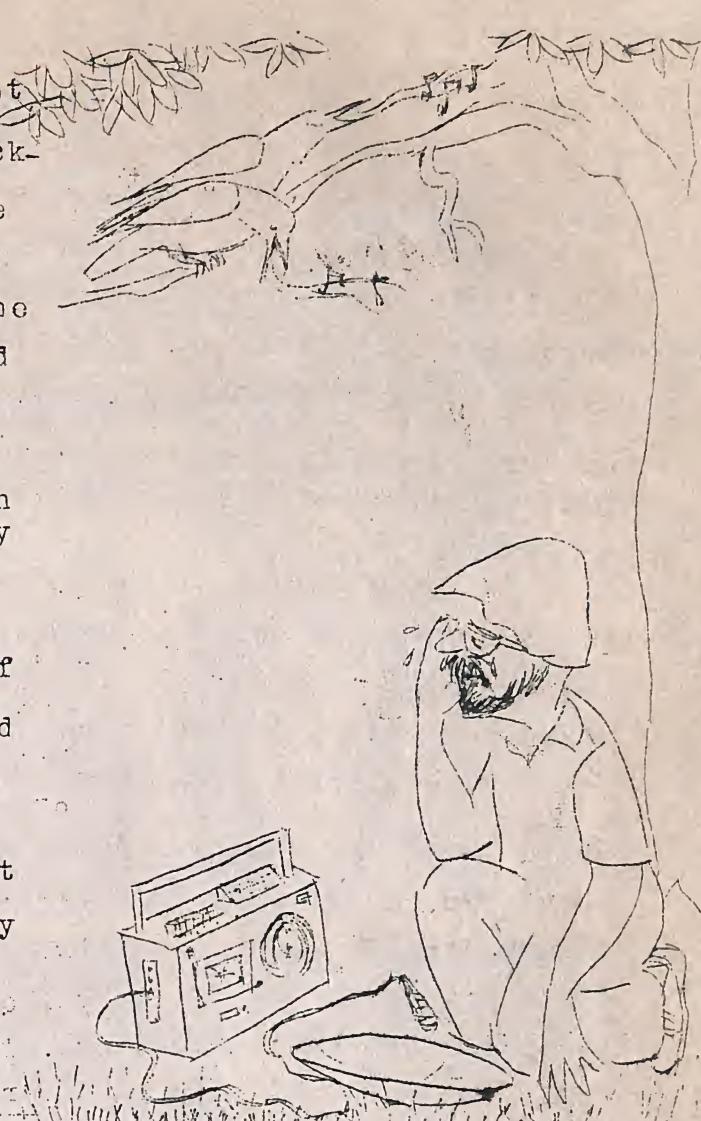
Except for a meagre share by Jaggi and Suresh, it was, actually the girls who brought lighter moments to our otherwise monotonous trip. There was Vinutha who went down to the water edge to wash her feet but appeared to be executing a fine half-somersault (a la Asiad '82) from the bottom most step just a foot above the water,

to find herself standing in a two feet deep water. We could not help laughter at the way she rocked her stunned self out of the water, afraid of the crocodiles snapping her feet. Later when the water level in the river dropped down exposing a fine stretch of murky sand bar, Jayanthi went over to demonstrate her skill in 'Speed skating' on that slippery mud, but came down flat with a resounding thud and the other two had to help her to scrap off the murky mud that plastered all over the back of her dress. Pavitra strayed away from water and murky mud but chose the foot wide bunds in the adjacent paddy fields instead, to try out her excellence in 'high-wire balancing act'. She must have been disappointed with herself for,

every time she tried to take a step, she slipped down into the paddy puddle two feet beneath. Since everyone of us followed her example, the irritated owner of the field came out screaming at us for having trampled his fine trimmed bunds out-of-shape.

For some time, we rested under the shade of a tree at the water edge- a little away from our camp site. Here we spotted a pair of Small Green Bee-eaters making sorties from an exposed perch, catching insects in midair as they flew about; and located a large ball shaped nest of Spotted Munia closeby, built atop a phoenix palm. As we stood examining the nest, the agitated bird perched within five feet from us, uttering alarm calls. Back at the water edge, few of us started to discuss the nesting habits of ibises and openbills. While Jayanthi joined us in our observations, Pavitra was seen mugging up her Botany class notes, telling aloud to a sleepy Vinutha as to what that botanical nomenclature and classification was all about(!) and Suresh was still fiddling with his 3-in-1 in a last attempt to record some bird calls. So unfortunate he was that the stubborn recorder refused to pick up even the loud ducting of a pair of house crows, barely 10 ft above him!!

During our observations we sighted a Marsh Harrier trying for a chance to make away with a nestling of the breeding birds





but the agile parents kept this predator (a migrant from Europe) at bay by wielding their long beaks held ready in wait. A Short-toed Eagle was seen marauding an Osprey (another migrant from Europe - also known as the Fish Hawk for its habit of catching fish with its specially adapted feet) that had a tall clump of bamboo as its favorite lookout perch. Higher up in the sky were quite a few openbills, soaring in spirals, rising higher and higher as they rode on the thermal currents. One bird was almost on the verge of becoming a speck in that distant blue nothingness. Besides, we noticed a large egret that maintained its sentinel erect stance for over half an hour, appearing as though it was carved out of solid ivory, sporting a black eye and a long yellow painted beak, and many juvenile egrets

on ground looking quite lost. The paucity of Pond Herons and a total absence of Marsh crocodiles (Crocodylus palustris) was quite striking.

In the islets were several thousands of ibises, cormorants, openbills, darters, egrets and herons; their nests crowded on the host trees thickly, separated a foot or two from one another, in all directions--sideways, up or down. I presumed that such a spatial packing may not have been due to intense competition prompted by acute nest-site limitations, but with a purpose, because, these species show a definite spatial segregation (layering) : the night herons near the ground level, cattle egrets few feet up, darters near the top, cormorants little below and the ibises almost in the middle. At this point what intrigued me was the clannishness of certain nesting species, i.e., white ibises, cormorants and openbills were great segregationists, keen on establishing their exclusive 'mohallas', refusing to mingle with any other species, while the egrets, herons and darters not caring a tuppence as to which caste their neighbours belonged to, formed thoroughly cosmopolitan nest-settlements. The question that kept pondering me was-- why ibises, storks and cormorants have to be such a segregationists? Why can't they mix with others? -- to this I could not think of any plausible explanation.

At 11.45 a.m. after another long boat ride around the islets, during which we sighted the Great stone plover, purple Heron, pied Kingfisher and the (only) Pond Heron, we trekked back to the Bangalore-Mysore road and sighted a common sandpiper (a species from beyond the Himalayas) by the Virija Channel. We reached Paschimavabini

where we had our lunch of chapatis, boiled eggs, fried peas, pickles and cucumber, but not before Jaggi had a plunge in the flowing Kaveri to let off the steam (he still had not got his idlis, for even the coffee shop owner at the sanctuary refused to supply them). We sighted here, the fine specimens of Grey Hornbills and Small Minivets in the high canopy of the rain tree.

After a short bus ride we reached Mysore and paid a visit to Jaggi's place to have a cup of coffee for which, to make the short way long, he took us in a series of what he called 'short cuts'. With Vinayak and Jaggi dropping back, we boarded the Bangalore bound bus at 5.00 p.m. and were back home by 8.30 p.m. on the Saturday, the 8th of October, 1983.

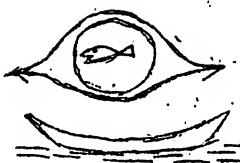
— S. Subramanya

List of the birds sighted in Ranganathittu environs :

1. Large Cormorant (Phalacrocorax carbo) 2. Little Cormorant (P. niger)
3. Indian Shag (P. fuscicollis) 4. Darter (Anhinga rufa)
5. Purple Heron (Ardea purpurea) 6. Pond Heron (Ardeola grayii)
6. Cattle Egret (Bubulcus ibis) 8. Large Egret (Egretta alba) 9. Little Egret (E. garzetta) 10. Intermediate Egret (E. intermedia)
11. Night Heron (Nycticorax nycticorax) 12. Open-billed stork (Anastomus oscitans) 13. White Ibis (Threskiornis melanocephala) 14. Spoonbill (Platalea leucorodia) 15. Brahminy kite (Haliastur indus)
16. Marsh Harrier (Circus aeruginosus) 17. Short-toed Eagle (Circaetus gallicus) 18. Osprey (Pandion haliaetus) 19. Common Sandpiper (Tringa hypoleuca) 20. River Tern (Sterna aurantia) 21. Great Stone Plover (Esacus magnirostris) 22. Spotted Dove (Streptopelia chinensis)
23. Coucal (Centropus sinensis) 24. Collared Scops Owl (Otus bakkamoena) 25. House Swift (Apus affinis) 26. Pied Kingfisher (Ceryle rudis) 27. Whitobreasted Kingfisher (Halcyon smyrnensis)
28. Small Blue Kingfisher (Aldo atthis) 29. Small Green Bee-eater (Merops orientalis) 30. Grey Hornbill (Tockus birostris) 31. Coppersmith (Mogalaima haemacephala) 32. Cliff Swallow (Hirundo flavirostris)
33. Brown Shrike (Lanius cristatus) 34. Common Myna (Aridotheres tristis) 35. Jungle Myna (A. fuscus) 36. House Crow (Corvus splendens)
37. Jungle Crow (C. macrorhynchos) 38. Small Minivet (Pericroctes cinnamomeus) 39. Iora (Aegithina tiphia) 40. Red Whiskered Bulbul (Pycnonotus jocosus) 41. Tickell's Blue Flycatcher (Muscicapa tickelliae) 42. Whitespotted Fantail Flycatcher (Rephidura albogularis)
43. Streaked Fantail Warbler (Cisticola juncidis) 44. Indian Wren Warbler (Prinia subflava) 45. Ashy Wren Warbler (P. socialis)
46. Tailor bird (Orthotomus sutorius) 47. Booted Tree Warbler (Hippolias caligata) 48. Magpie Robin (Copsychus saularis) 49. Pied Bush Chat (Saxicola caprata) 50. Grey wagtail (Motacilla cinerea)
51. Large pied Wagtail (M. maderaspatensis) 52. Purple-rumped Sunbird (Nectarinia zeylonica) 53. White-eye (Zosterops palpebrosa)
54. Roseringed Parakeet (Psittacula krameri) 55. House Sparrow (Passer domesticus) 56. Baya Weaver Bird (Ploceus philippinus)
57. White backed Munia (Lonchura striata) 58. Blackheaded Munia (Lonchura malacca) 59. Spotted Munia (L. punctulata)

— S. Subramanya

OCEANS FOR ADVENTURE



The trip to Mangalore, which borders the usually calm Arabian Sea, was planned for three days (Dec 24, 25 and 26, 1983). The day-to-day programs were scheduled well in advance. The team consisted of seven SF members : Gopal, Jagannath, Jayanthi, Mamatha, Pavitra, Sudharshana and Suresh.

The fully equipped team (but without the SCUBA* gear), boarded the 'fast' train 'Mangala' at 10 p.m on 25th Dec. The selection of the train which in fact is a crawling one, was done so as to enable us to view the Western Ghats; the site for our future expedition. The double engined short train started to climb the Ghats at daybreak. As we proceeded from tunnel to tunnel (57 in number), the hills unveiled their complete beauty. After 16 hours of tiring but worthwhile journey, we reached Mangalore at 4.30 p.m.

The same evening we visited the beautiful Panambur beach, a fine sandy beach. As we stood watching the sunset, with the cool breeze blowing, we could see the country boats sailing back with their catches. The blue flashes of a distant light house and the buoys, which border the channel into the port area, were becoming conspicuous. We had to be satisfied with the glimpses of the 'New Mangalore Port', as it required prior permission to visit it. Though everyone was tired, the Iodine rich breeze probably triggered off our spirits for further ventures...

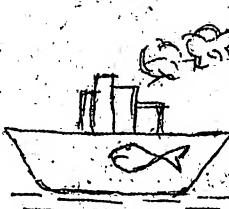
25th Dec....

The second day's visit was to St. Mary's group of Islands, fishing harbour, the fishing village and processing industries around Malpe. It was a two hours journey from Mangalore. The mechanised boat which took us from Malpe harbour, set out into the deep blue sea towards the group of Islands. During this journey, a few of the members were lucky to sight a 'dolphin', gliding the rhythmic movement of the waves. As it was not possible to take the large boat ashore, because of the rough sea and violent waves, we were dropped on the main Island by a small canoe.

The Island we landed on was about half a square mile in area. It was known as the 'Coconut Island'. The view of the Island with huge masses of rocks, the shining sand and palm trees around, was a breath-taking one. The outstanding feature of the rocks on this island was that they appear as hexagonally cut pillars arranged together. These rocks have been formed due to the eruption of the molten lava million years ago. This island is now one of the Union Territories of our country. It provides a very good opportunity for sea shell specimen collectors. After spending about five hours here, we returned back in the rough sea to the harbour.

Fishing boats (trawlers, purse-seiners), were busy landing

* Self-Contained Under Water Breathing Apparatus



their catches. Fisherwomen who do the sorting of different varieties of fishes in their respective boats, were not bothered by our presence. The whole process of marketing of the catches are done in the auction hall itself, where a government auctioneer mediates between the wholesale buyers and the fishermen. Our team had the opportunity to study the various sea organisms here (see the separate report).

Our next visit in Malpe was to the Coronet fish canning industry and block ice unit. The canning industry was in full operation, processing the fishes like mackerel, sardine, prawn. We were shown the various processes/operations like can body forming, lid formation, lid seaming, embossing, cleaning the fishes, size cutting, packing, pre-cooking, media filling (oil or tomato sauce), vacuum seaming, retorting for sterilization and labelling. This unit employs around fifty workers, mostly women; conveyor systems are used wherever required. Some salient features of the unit :

Production capacity	: 20,000 cans/day (2 nd hrs shift)
Cans used	: No. 1 tall, SR lacquered
Main market	: Defence units and Gulf countries.

Ice block manufacturing units are a very common sight wherever there is fishing industry, since sea foods are easily perishable commodities. In a typical block making ice unit, blocks of 50-100 kg are manufactured and supplied to the processing industries and fish merchants. It is a two phase refrigeration system, where the refrigerant coils are laid out in a big tank around which brine (secondary refrigerant) is circulated. The temperature goes below -40°C, the ice cans with water are immersed and covered. After 24-36 hours, ice blocks are formed.

Amidst all these official visits was an unofficial visit to guess where?... A visit to the famous Krishna temple at Udupi! probably it was to pray for our safety in the sea the next day. We returned back to Mangalore by 9 p.m., and our guest house keeper was waiting there for us, with his preparations of delicious dishes of fishes.

26th Dec. ***

The days program was a trip on a commercial purse-seining fishing boat, 'Hithalakshmi'. It was a 54-footer vessel; driven by a 100 H.P. engine. We were dropped at the launching place in a jeep in the early hours (5 a.m.). At 6 a.m we set out into the sea, crossing the Estuary and the seamount. It was the most unforgettable day for many, since being in the sea from the break of dawn to three O'clock in the evening is really a super feeling. Except the few who were sea sick, the others enjoyed every second of the trip. The boat which also towed along with it a small carrier boat, covered 8-10 nautical miles deep into the sea, in search of surface shoaling fishes. It was our bad luck, that the operation of the huge net could not be seen. Only the knowledge of the whole operation had to make us content. The crew were enjoying our company, though they failed to

locate a fish shoal.



Purse-seining is a type of fishing using huge encircling net. It is operated for capturing fishes like mackerel, sardine etc. which are surface shoaling. Karnataka was the first state to introduce this type of mechanised fishing in 1972. Presently, there are more than 350 purse-seiners operating along the 310 kms coastline of Dakshina and Uttara Kannada. The investment on fishing equipments are very high, the cost of the boat being Rs 2-3 lakhs and the net costs around Rs 2 lakhs. It is a labour intensive process, needs around 20-25 crew members. The crew share 30% of the total catch money during the fishing season (Aug-April). The operation of the net is done only after detecting the shoal by expert observers. They usually look for the ripples on the water, color change, presence of sea birds, dolphins etc. The carrier boat will then ^{bend} one end of the net and the main boat encircles the shoal with speed. Then the two ends of the net are held together and the purse line is pulled. This completely traps the fish in the purse shaped net. The fishes are scooped on the boat and carried to the landing centre by the carrier boat. The main boat then awaits for the next operation. In a good fishing day, 5-6 operations are done. The record catch in the purse-seiner along Mangalore coast is the one ^{of} 40 tons of sardines on a single day.

Along the coastline few 'Rampani' operations were sighted. Rampani is an encircling type of drag net operated in shallow waters near the shore. The shoaling fishes which come near to the shore for feeding, are captured in this net. It is a community fishing, involving members of fishermen family. Nowadays this traditional fishing is rare, due to the introduction of purse-seiners. Thanks to the Karnataka Government, for passing recently a Fisheries Bill, which demarks the zone of fishing and seasons of fishing for the mechanised boats, which in some way, will help the small traditional fishermen.

Around 3 p.m. we came back empty handed and landed at Mangalore Bunder. Our next visit was to the Technology Wing of the College of Fisheries. There we were taken around the Ham and sausage section, Freezing section, Fishing and Gear Technology divisions. There we saw equipments like meat picker, meat mincer, meat chopper, sausage filler, conveyor, boiling unit, contact plate freezer and a typical frozen storage room. In the Fishing and Gear Technology division, we were briefed about models of different nets, net fabrication and electronic fish locator (echoe sounder).

Later, we returned to the main college campus, and as a last part of our trip, we met the members of the 'Pasteur's Society' (similar to our own Science Forum). The scientific activities of the Society was explained to us by its president, Dr. Karuna Sagar. One of our team member spoke about Science Forum's activities, with a slide show of our previous trips. The Pasteur Society members branded us as 'Adventurers with a Scientific Outlook' and wished our SF for further adventures and progress.



The 'adventurers' were still interested in visiting the departments in the main campus. But we had very little time left, so we hurried back to our rooms to pack up for the return journey. Our hosts gave us a warm send off as we boarded the night bus to Bangalore.

The memories of the Mangalore trip is still fresh in our minds. Whenever we see a fisherman now, we remember the saying :

" Give me a fish, I live for a day
Teach me to fish, I live for ever "

-- Sudarshana L.

Fishes and other organisms sighted during the Mangalore trip

Fishes :

Group Elasmobranchs (having only cartilaginous backbones)

1. Dasyatis himantura : Banded whip tail sting ray
2. Dasyatis sp. : Bat ray
3. Scoliodon sarrakowath : Yellow dog shark

Belonging to teleosts, the present day bony fishes (having vertebral or back bone)

4. Tachysurus dussumieri : Marine catfish
5. Trichiurus lepturus : Ribbon fish
6. Nemipterus japonicus : Pink perch or Madumai
7. Sillago sihama : Silver whiting/Lady fish
8. pampus argentius : Silver pomfret
9. Rastrelliger kanagurta : Indian mackerel or Bangadei
10. Sardinella longiceps : Oil sardine or Bhutai
11. Thrissocles mistax : Lesser sardine
12. T. purava : Anchovies
13. Cynoglossus semifaciatus : Malabar soles
14. Lactarius lactarius : Butterfish/White fish
15. Caranx sp. : Horse mackerel
16. Johnius belengeri : Croakers/Jew fish
17. Kowala coval : White sardine
18. Muraenesox cinerens : Conger eel
19. Leiognathus bindus : Silver bellies

Prawns

20. Penaeus indicus : White prawn
21. P. madoh : Tiger prawn
22. Metapenaeus affinis : Brown prawn
23. Neptunus sp. : Edible crab
25. Scylla serrata : Edible crab
26. Parapenaeopsis stylifera : Shrimps
27. Penulirus homarus : Spiny lobster
28. Mole crab & Fiddler crab : found on the beaches, non-edible

Molluscs belonging to Cephalopods & Bivalves

29. Loligo sp. : squids
30. Sepia sp. : Cuttle fish
31. Aurelia sp. : Jelly fish
32. Ostrea sp. : Clams
33. Oysters (found clinging to rocks) : Shell fishes

Marine fouling organisms

34. Barnacles : Cirripedes
35. polychetes : Tube worms
36. Bryozoans, found attached to the wooden jetty & boats
- Sea birds
37. Larus brunnicephalus : Brown headed gull
38. Calidris minutus : Little stint

Sea weeds

39. Sargassum : Free floating algae
40. Ulva sp. : Grows on rock

Mammals

41. Bottle nosed Dolphins
 42. porpoise, belonging to whale group of Cetaceans
- Apart from the above fauna and flora, many varieties of calcareous shells of gastropods, bivalves were found on the beaches of St. Mary's Island

-- Sudarshana L.

OCEANS OF (MIS)ADVENTURE

The long vacation was welcome especially as we were going 'Deep Sea Fishing' to Mangalore! We jumped about in excitement as one of the senior SF member asked "Have you ever gone SCUBA diving?" implying that we would be diving this time. Fortunately or unfortunately, no one was around as the last exam had finished in the morning. Otherwise, we were so happy that we would have gone around GKVK, telling everyone about it!

We started at 10.30 pm by Mangala Express which took its own sweet time to cover the distance to Mangalore. Sweet, because Nature was the reigning beauty all the way. We devoured the rare green beauty till our eyes started burning. The mist rising in the valleys, the tall green vegetation, the lively brooks... it was beyond description! The tiredness of cramming sheets and sheets of notes into the brain had vanished without our knowledge !!

Bangalore skies were hanging low when we left but as we were nearing Mangalore, we had to pack up our warm sweaters. The warm clothing we had carried was more of a hindrance under the burning sun in Mangalore.

We reached Mangalore at 1.30 pm the next day and were greeted by Sudarshana's friends. We (girls only) were given accomodation in the guest house. The accomodation was superb and we are now regretting that we did not make full use of the facilities. We had no time for luxuries and as we were so busy and happy as we were; that we had forgotten about it!

That evening we went out to the beach and had a gala time. We were interested in seeing the inside of the Port but unfortunately, our charms did not work on the guard!

Next morning, we went to the St. Mary's group of islands and collected some beautiful shells there. The beauty of the islands amidst the blue waters was beyond words -- just as the stink of the fishes in the Malpe harbour was! We had to literally stuff cloth into our nostrils much to the amusement of onlookers. What was sickening to us was apparently very fragrant to them !!

After visiting a canning centre, we returned to Udupi. Since it was Christmas, we were on the look-out for cake. It also happened to be one of our member's birthday, but wherever we looked, we could see only gaudy pink cakes, which put us off! We ended up going to the temple and eating 'Gadbad' ice cream in a restaurant! When we said that we wanted to go to a movie, our seniors were kind enough to show the picture poster outside the theatre!!

The following day, we were to start at 4.00 am. the actual purpose of our visit was to be fulfilled. We were told to be ready ready before 4.30 am and we assured that we would be ready before them but slept like logs till they came and banged on the door of our room! As a junior member was seasick the previous day, Jagannath, our

Veterinarian member, prescribed some tablets to all of us as a precaution. Call it intuition-- three of us were reluctant to take the pills. The rest took it obediently and we started out into the sea, just before sunrise.

The members under dosage started nodding off into sleep even though they were just standing on the deck! Unfortunately, the Vet had forgotten that he was treating human beings and had prescribed cattle dosage!! While they slept like Rip Van Winkle, we had a fantastic time on board. The fishermen were friendly; they cooked lunch for us and we even navigated the boat. Probably, that was why they didn't catch fish day ! Had we stayed there for some more hours, we would have become real fisher folks. We learnt their song too !! Later, we overheard one of the victims saying that they would have been better off without the tablets. They were all the more sick now ! Oh, that faraway, forlorn look on their faces !!

After visiting the College Canning Center, we returned to our base and went to meet the members of the Pasteur's Club (Mangalore Science Club). Most of their members were away on State or All-India Tours. We had a few memorable hours with them, even succeeding in getting ourselves dubbed as 'Adventurer's Club' !

When we asked one of those members if he had been Scuba-diving (he has taken up Oceanography) he said he had only seen the demonstration ! Thanks to the members of that club and our club, we had the most enjoyable stay there. I suddenly start singing the song to myself, that goes thus

"Those were such happy days
and not so long ago..."

Business and pleasure were so efficiently mingled that...
Well, NOSTALGIA !

-- Mamatha

*EYES**

Toscanini conducting,
eye strings taut to the universe ;
Einstein staring at velvet infinities,
Newton staring at the apple,
Copernicus at the sun,
Galileo at a new-found star,
the eyes of a new-born infant
still full of the womb
taking in the glow of a just born-world

Every once in a while there are born two eyes
to which all things are ever christened with light

William Howard Cohen

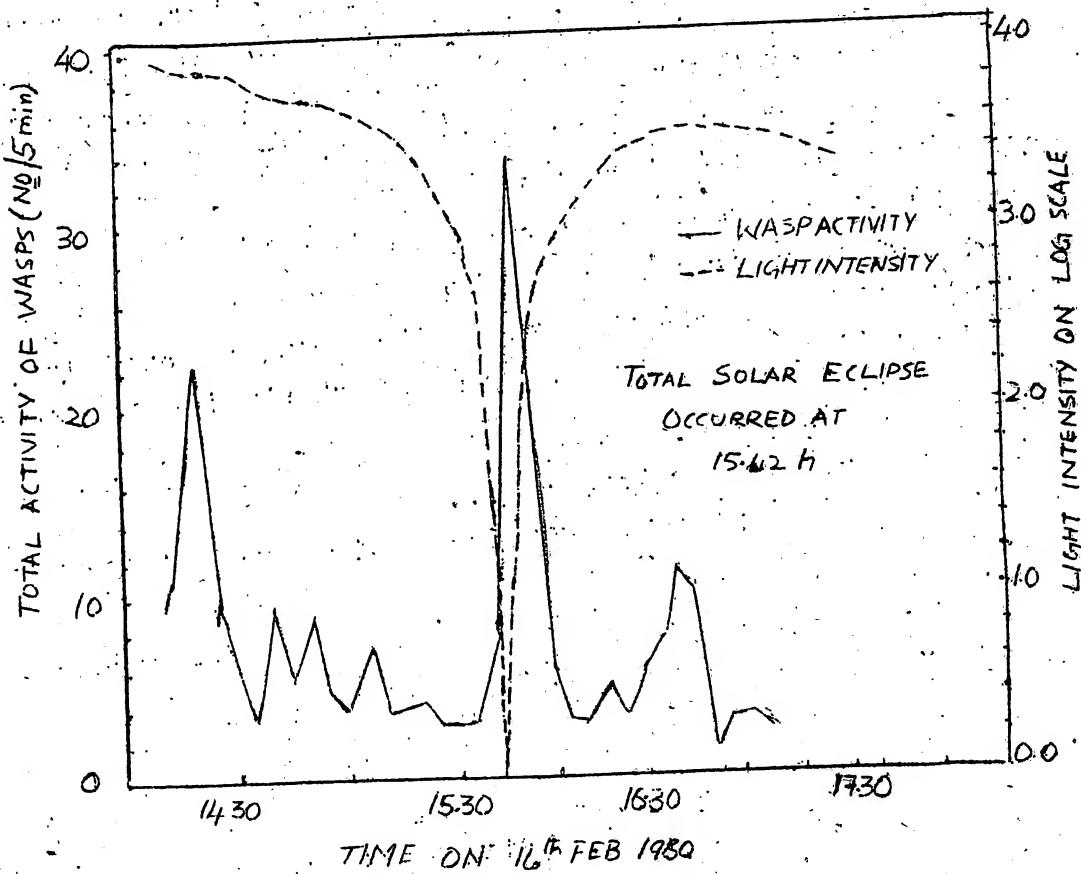
* TV camera focuses through the orchestra into the face of Toscanini conducting Beethoven

DOES TOTAL SOLAR ECLIPSE AFFECT THE FORAGING BEHAVIOUR
OF Ropatidia marginata?

44

The biological rhythms regulated by the physical factors like light, temperature, humidity, etc. are well known among insects¹. Often these rhythms are independent of the alteration in such physical factors, while certain others appear as correlated responses to the changes in these factors. Foraging activity in social insects is one such behavior that depends on light intensity fluctuations². A study was therefore undertaken on a social wasp (Ropatidia marginata Lep.) during the Total Solar Eclipse on Feb 16, 1980, to observe the influence of the abrupt fluctuation in the natural light intensity on the foraging behavior and activity.

Since Dharwar happened to fall in the line of the Total Solar Eclipse, two nests of R. marginata located in the Agricultural College Campus, Dharwar, were utilized for this study. The number of wasps going out for foraging (out-going) and those returning to the nest (in-coming) in every five minutes were recorded, from 1410 to 1700 hrs. The sum of 'in-coming' and 'out-going' wasps was computed to represent the foraging activity of the colonies.



The foraging activity and the changing light intensity from an hour earlier upto one hour after the solar eclipse is presented in Fig. 1. Clearly, the solar eclipse has considerable effect on the wasp activity. This is evident by the following observations :

1. The wasp activity has decreased with the onset of the eclipse ;

2. There is a sudden spurt in the activity immediately following the eclipse, indicating the confused situation of the wasps due to sudden appearance of intense light, and

3. They resumed the normal activity following the eclipse.

The activity of the wasps, represented as the number of foragers/five minutes decreased gradually from as high as 22.5 at 1420 hrs (6000 foot candles) to as low as 3 at total eclipse (0.0 f.c.). Immediately after the eclipse, a sudden spurt was observed in the activity of the wasps which later stabilised as the light intensity reached the normal level.

The response of the wasps to the fluctuation in light intensity simulated the response of diurnal insects to the decreasing light intensity of evening hours and increasing light intensity of morning hours. In other words, the foraging activity of R. marginata appeared to be regulated by light intensity. The precise range of light intensity at which they begin to respond was found to be 100-200 f.c., since at this range they regained maximum activity.

Our thanks to Dr. Ram Mohan, Department of Physics, Univ. of Agril. Sciences, Bangalore, for providing us the data on light intensity.

¹ Insect Photoperiodism, S.D. Beck, 1980.

V.V. Belavadi

K.N. Ganeshaiyah

Academic Press. NY. pp. 287

T. Shivasankar

² Insect Clocks, D.S. Sanders, 1976.

Pergamon Press. pp. 279

CONTINUED FROM PG. 26

only one male larger than the female among spiders - the male easily dominates his spouse. After mating, the female adds a second storey to her bell, where the eggs will be laid down and hatched. After 27 days, the young one batches and sets out on its own. Gnawing its way out of the sealed upper storey of the maternal egg bell, and carrying a diminutive bubble of air - a life giving legacy from its mother's bell - the spiderling will soon swim to the surface for a new supply...

Of course, man imitated the A. aquatica or the water spider's house about 200 years ago, but the Diving Bell was a crude copy of the spider's water residence. People were impressed by it as it was the first time man had ever been able to stay under water for any length of time without being drowned. But man did not, like the spider, live in it, keep his wife in it, and bring up his children in it...

AN OBSERVATION ON THE NESTING BEHAVIOUR OF A
POMPILIDAE sp. *

Wasps, in general, paralyse other insects by the venom injected through their sting. Unlike these parasitic wasps, there is also a family of wasps, Pompilidae, generally called spider-wasps, whose preys are not the hexapods but the octopods (spiders). The paralysed spider is the source of food for the spider-wasp's larva (adults do not hunt spiders for their food).

In this note, we would like to present our observation on the typical nesting habit of a spider-wasp of Paragenia sp.

Date : 14 Apr 1984

Time : 6.12 pm to 8.15 pm

Habitat : Banks of the river Cauvery (Sangam), sandy place.

This spider-wasp was greyish white with black band on its abdomen and with long slender greyish white legs. Two pairs of long narrow wings were transparent and well veined. The mesothoracic pair of wings were longer and black stained at the tip. The thorax was very long, almost the same length of the abdomen. It was a medium sized spider-wasp with body length (excluding antenna) of 1.5 cm and a wing spread of 2 cm.

She was carrying a paralysed spider (bigger than her self) and searching a place to hide it. After finding a suitable place, she concealed it with sand and left in search of a suitable place to dig a nest. She selected a place and started digging a hole. After some time, she went to 'check' her prey. Soon she returned to the nest site and continued the digging. Once again she stopped to check her prey. To our surprise, she could not trace back her way to the nest (though this is unlikely, even slight disturbance near the nest like even removal of a dried leaf from near the nest might confuse the wasp and make it to lose its way). Thus once again she had to start from the beginning -- she searched and selected a new site and dug a new nest. Instead of just checking, this time she brought the prey itself near the nest (may be she did not want to take the risk of losing the track once again). After digging the nest for 4 minutes, she took her prey inside the nest (under construction). The digging of the nest and dragging of the prey lasted nearly for an hour. During this period she sat upto the entrance of the nest at intervals of every 30 seconds on an average (range 12 to 64 sec) in order to dispose the sand.

Then, (I think) she deposited her eggs on the paralysed spider, because it took quite a long time to come out (27 min 30 sec). Immediately after she came out, to our astonishment, she became busy on destroying the outer appearance of the entrance of the nest, probably to mislead its predators and parasites.

Soon after this, the same wasp sighted a big spider and

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* This report appears to be the first one on the behavior described in it - Ed.

The Trip

19 Feb 1984 : We were on our way to Nekedaatu (Sengam)*. The soap box competition was on. Gans (Ganeshaiab's) group won a point against ours but still we managed to beat them in their own game. I was thinking, since a long time no one has offered me a party and I knew, the easiest way of getting one, atleast in our group, was to wish him/her on his/her birthday and demand a party. And usually I/we would get it. There were 18 of us in the matador. So there were 18 potential parties just lying around. What I had to do was to just know their birth dates and demand. Who knows ? Someone may be happy to offer one soon after we return to Bangalore; how nice it would be (I thought). With such high expectations, I started collecting the dates of birth of the 18 people. Alas, the earliest birthday was in April end ; I blamed myself for the bad luck.

The Turn

We had covered only three fourth's of the distance and having nothing else to do, I glanced through the birth dates in a depressed mood. Look at that, I told myself, there is a kind of rhythm in it. Majority of this group were born either in May or October. I was tempted to draw a graph with months on 'x' axis and frequency on 'y' axis. It turned out that 9 out of the 18 fell either in May (4) or October (5). Interpreting further, it was evident that exactly 9 months May, it was the beginning of Winter and 9 months before October, it was the end of Winter season!

Maybe our parents have more intimacy during the beginning and end of Winter season!! However, I could not conclude anything from so meagre a data. A question sprang up in my mind, from which age (Zodiac sign) do our agriculture students come from ?

The Next Day

There is an article in Nature, Gans told me, in which Windsor, had observed that molecular biologists come of age in Aries (March 22-April 20), i.e., if one was born Aries, the probability is high that he/she will become a molecular biologist or if one is a molecular biologist, it is highly probable that he/she was born Aries.

This piece of information encouraged me to proceed, but how interesting it will be if I can hit upon the Zodiac Signs of Nobel Laureates instead of Agril. Students.?

Consequently, I collected 365 Nobel Laureates birth dates, the number of Nobel Laureates born under each sign were tallied and the relative frequencies were expressed as an index (each value divided

* We were going to study the behavior of ant lions and tiger beetles for the "Evolution" course, being taught to us by Dr.K.N.Ganeshaiab

by total, times hundred). The expected frequency was calculated as 30.41, ($365/12$), and when χ^2 was fit, a problem figured out, i.e., the distribution of Nobel Laureates was significant at 5% level, so the Nobel Laureates have a tendency to come under one zodiac sign. But, at 1% level, the distribution turned out to be non significant!!

By this time, I was sure that there was a flaw in taking 30.41 as expected frequency. It would be better if I take the general population's frequency, as Windsor did, as expected frequency. Siga and Reddy collected 1924 dates of birth of scientists from different fields. The frequency was found out under each sign and χ^2 was again fit! As against my expectations, I learnt that the distribution of Nobel Laureates was the same through out, i.e., all the zodiac signs have equal chances of throwing out Nobel Laureates! (ref. table below).

Table 1.

Signs	NL (O)	O%	GP (E)	E%	χ^2	Dates
Aries	31	8.5	82	8.0	0.03	Mar 21-Apr 20
Taurus	39	10.7	90	8.75	0.41	Apr 21-May 21
Gemini	35	9.0	65	6.7	0.75	May 22-Jun 21
Cancer	32	8.8	79	7.7	0.65	June 22-Jul 23
Leo	25	6.7	67	6.5	0.006	Jul 24-Aug 21
Virgo	39	10.7	99	9.7	0.10	Aug 22-Sept 21
Libra	39	10.7	81	7.9	0.99	Sep 22-Oct 23
Scorpio	21	5.7	80	7.8	0.57	Oct 24-Nov 21
Sagittarius	39	10.7	90	8.75	0.46	Nov 22-Dec 21
Capricorn	19	5.2	88	8.6	1.34	Dec 22-Jan 20
Aquarius	26	7.1	94	9.2	0.03	Jan 21-Feb 19
Pisces	22	6.0	195	10.2	1.73	Feb 20-Mar 21
	365	99.8	1024	99.8	6.86618	

Table χ^2 value (11 df) 5% : 19.675 1% : 22.50

NL : Nobel Laureates
GP : General Population
(1924 scientists)

O : Observed frequency
E : Expected frequency

Now, Why is that there is a tendency of the Aries born to become molecular biologists? Do stellar bodies have any effect on the personal careers? Should we believe this?

The first question gets the answer from the second question and for the third question, the answer would be 'yes' or 'no' according to your beliefs. But ... the discipline of scientific enquiry is lacking in many a field. Astrology, unequivocally, stands among them. Thousands of horoscopes are written everyday based on the positions of planets, stars and other heavenly bodies. It is known since ages that these heavenly bodies have influence on human affairs. The due scientific attention has not been paid so far, for the same. Windsor's paper, "Do molecular biologists come of age in Aries?" was

a much needed step towards the scientific unravelling of Astrology.
I hold a similar view like that of Windsor, who says,

"My data were, admittedly, meagre, but it was hoped their publication would inspire or even goad scientists with more resources to pursue this line of research by acquiring and analysing larger data bases. The basic concept of extra terrestrial influences on human activities is so important that it certainly deserves much more investigation than is now being performed".

No science was science in its beginning and maybe Astrology is at its beginning.

Balakrishna

Thanks to:

¹ Windsor, Nature, 1974, 248, 788

² Windsor, Nature, 1974, 252, 178

Gans, Siga and Gopal Reddy.

contd. from pg 46

and tried to sting it but without success. The spider also charged in return. She tried once again but failed to sting. One more charge by the spider made her to abandon the idea of paralysing it. She came back near the nest and made an inverted V shaped nest (a pseudonest or a nest for herself ?) - it was never answered since the observation had to be discontinued because of extreme darkness...

Vishwa Ranjan Amatya

Vasudev R.

Immortality

I've willed my corpse to science,
And I'm hopeful that some day,
A portion of my carcass
May prove useful in some way.
Perhaps both of my corneas,
Or may be a kidney,
May be of use to some one else,
As they have been to me.
There are reasons for my pleasure
In making this decision,
Beyond the simple pleasant thought,
I've helped somebody's vision
There is the grim and sordid thought,
Which I just hate to think,
that I've decayed so gosh-darned much,
Soon as I die I stink.
But I now have what most folks want,
A sort of guarantee,
A fraction of me may well get
Immortality.

Carl A. Dragstedt

The Prize

Up or down
The tortuous tree life came
But one conceited to his name
Man, conceived in phylogenetic
fame
The prize perfection
Homo self proclaimed
And to his ancestors
Awarded blame

Joseph Patrick Kennedy

First Chronic disease

Quoting himself with consummate ease
Man's earliest, incurable
disease

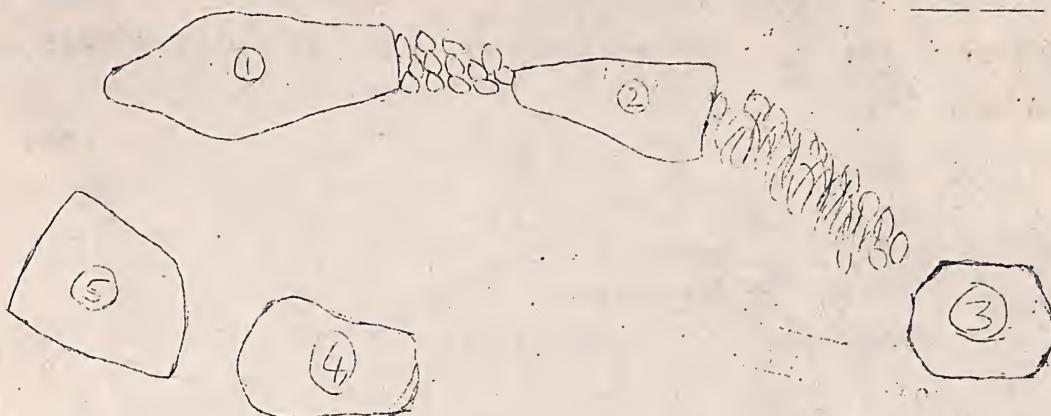
David Seegal

MEGALITHS ON MIRZA HILLS

"The light of the shaft fell directly on a table in the middle of the room : a single oblong block, about two feet high, upon which was laid a great slab of white stone.

'It looks like a tomb,' muttered Frodo, and bent forwards with a curious sense of foreboding, to look more closely at it..."

J.R.R.Tolkien, The Fellowship Of the Ring



Top view of the megaliths on Mirza Hill

Believe it or not, Bannerghatta forest has some of the most potential historical and archaeological sites. These sites, primarily megaliths, were discovered just last year, independently by Archaeologists from the Archaeological Society of India (ASI), and two SF members (Uma and Ganeshiah).

Megaliths are one of man's earliest creations of stone, and possibly, the most intriguing as well. A megalith (Gr. *megas* : big, *lithos* : stone) is a roughly dressed stone, or monument made of such stones, either standing alone or grouped together into structures. The word megalith was coined by Algernon Herbert, an Oxford Don, in 1849.

It is estimated that there are at least 50,000 of them all over the world, predominantly in Europe, Britain, France, Scandinavia, Portugal, Malta, Japan and India. Most, but not all, are burial tombs. They range from 2-3 ft to 67 ft high and weigh from 5 to 100 tonnes. Most famous are the ones at Stonehenge where huge stone blocks weighing upto 70 tonnes were deftly slid into place (and equally big lintels are placed on top) during 4000 B.C !

In India, megaliths are found all over the country, except in the Indo-Gangetic Plains, Rajasthan Deserts and parts of Gujarat. Well, a book can be written on these fascinating structures*. But in this preliminary report, we wish to discuss on the megaliths we are studying in Bannerghatta.

In Bannerghatta, the megaliths can be seen on the slopes of

* Interested may read Reader's Digest's *The World's Last Mysteries* pp 64-92, and *Life Around Stonehenge*, New Scientist 5 Apr, 1984, 12-17

Mirza Hill, Hajaman Kal and Doddaragiballi betta (Eagles' Rock). We believe that there could be many more sites in the interior of the forest. Though a friendly Forest Range Officer agreed to drop and pick us up from any point in the forest (during July-Oct, 1980), we have not been able to explore the interior as yet, due to lack of free weekends.

You might wonder, well, what is so special about these megaliths in Bannerghatta? You would be surprised to know that these megaliths find no mention in the magnum opus Megalithic Culture in South India -- Regional Survey of Mysore State, by Gururaja Rao (1972) (obviously, it was not discovered then). Nor has any systematic study been done on them. Thus, this site is unique in that it was in oblivion for so long, though so near, and now, many renowned archaeologists are interested in it, as it could throw light on the culture during 300-500 B.C.

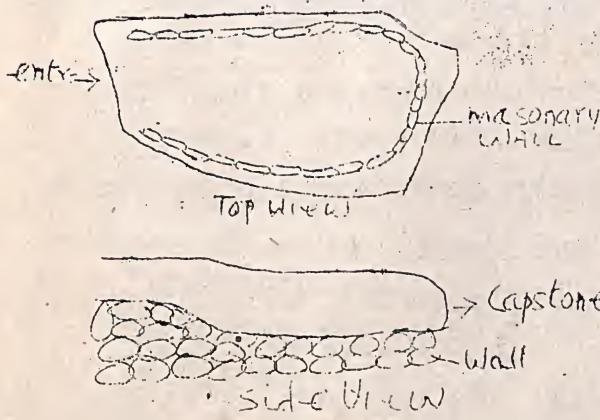
This report (though fragmentary, nevertheless the first one) is on the megaliths closest to the Bannerghatta Park, on the Mirza Hill.

On the slopes of Mirza Hill, there are about 8-9 megaliths. But we studied only one cluster, consisting of five megaliths, as they were relatively undamaged.

Each of the five megaliths is characterised by the following

1. A huge capstone
2. This capstone rests on a stone masonry wall which consists of layers of thin rocks, which are normally 2-3 inches thick and about 1'x1' size. These stones of the wall, are close fitting and smooth on the side facing into the shelter, and inside wall view the side projecting outside is rough, undressed.
3. The capstone, resting on the wall makes an enclosed shelter (with an entrance) like structure below.

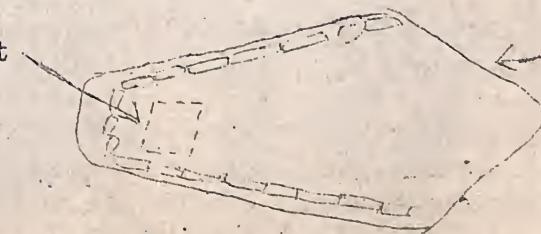
Megalith I



Least damaged of the five. Capstone measures approximately 13'x5'x1'. The height of the masonry rubble wall is about 1 $\frac{1}{4}$ -2 $\frac{1}{2}$ '. The shelter is enclosed well from all sides by the wall except at the entrance. There is a lot of rubble lying around, probably rejects. The floor is flat, covered with a thin layer of soil, below which are slabs. The shelter is a cozy snug place, measuring 6'x4'x2'. The capstone weighs approximately 5 tonnes.

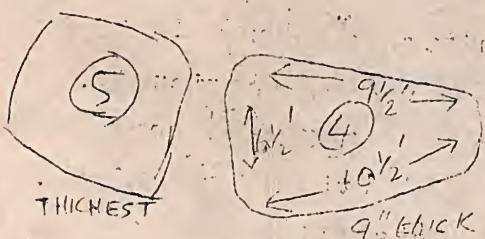
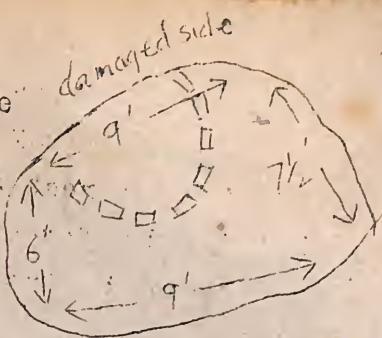
Megalith II

The interesting feature in this is the head rest at the apex. This head rest we feel could have some significance in the burial rites. The capstone measures 10'x5'x8" and weighs approx. 2 tonnes. The shelter measures 5'x3'x2'. The base is soil (?).



Megalith III

A circular type. The interior, as in the others has a clean finish. But the circular masonry wall is disrupted. The internal measures 5' diameter; 2' high. No head rest, soil base. Here we found a sharp edged stone, (?) which we replaced back inside. The capstone is 2" thick, weighing around 2½ tonnes.

Megalith IV and V

Too much damaged even for a preliminary study. Walls are not clear, due to displacement and the capstone on the last one which is the thickest, is broken into two.

All these physical descriptions can give you only a rough idea. It gives no authentic information about the people who built these megaliths, their culture and why were these megaliths built? To answer these questions, we proposed to study the following aspects:

1. Test whether the capstone is from the layers of the rocks on the slopes of Mirza Hill or not. This can be done by analysing the rock sample of the capstone and of the slope on which these megaliths stand. This is important, as in many cases, the giant stones were dragged from far off places, to the site, as in Shimoga, where no granite is in the vicinity, but granitic megaliths exist in some sites. In Kolar, the granite source is about two kilometer far from the sites. From such distances, hundreds of stones were dragged and assembled at the site. Alternatively, the steep inclination of the slope, the weight of the capstones, may preclude the possibility of the capstones being dragged uphill. We must also not forget that these megaliths are dated around 300-500 B.C or older. Then, Bannerghatta must have been a dense forest. So dragging the capstone uphill might not have been easy. We feel that the capstone must have been quarried from the slope itself as there is a brook at the base of the slope and water is essential for quarrying work. But these hypotheses can be answered by the rock sample analysis alone.

2. Most important is whether these megaliths were burial sites or not? It is generally known that most megaliths were used as graves, but many had commemorative value and not funerary^{1,2}. To test this, we are estimating the Calcium and Phosphorus contents of the soil in the pit (i.e., the shelter) of the megalith and compare it with the estimate of the same, in the surrounding soil. If the skeletal remains were decomposed inside the pit, then we expect a high Ca and P level.

3. Search the pit for potteries and iron implements, tools. One

¹Archaeology of India, A.N. Khanna

²Archaeology of South India - Tamil Nadu, K.S. Ramachandran